University of Zurich[UZH]

Shifting Education Towards Sustainability

How Degrowth Can Transform Education for Sustainable Development

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by
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Affidavit

I hereby declare that I have written the dissertation myself and that all material in this dissertation is my own work, except where I have indicated with appropriate references. I declare that this dissertation has not yet been submitted to any other faculty.

Sofia Getzin

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Abstract

Economic growth was identified as a main cause of ecological damage and social exploitation more than four decades ago (Carson, 1962; Meadows et al, 1972; Gorz, 1980; WCED 1987; 14). Not only are the effects of economic growth imprinted on the ecological sphere, economic growth has also become paradigmatic for mainstream education systems and societies in general. In the past few decades, ecological economics, growth critique and the degrowth movement have produced an increasing body of theoretical perspectives, empirical studies and practical approaches from different disciplines on the question of the future of economic growth (*e.g.* Weiss & Cattaneo, 2017; Kallis, 2017a; Paulson, 2017, Kallis et al., 2018). The discourse critiques the mainstream notion of Sustainable Development (SD) because it clings to the idea of continuous economic growth. Like the societal and political SD discourses, Education for Sustainable Development (ESD) deals with questions of sustainability in the field of education. The critical ESD community (*e.g.* Lotz-Sisitka et al., 2015; Sauvé, 2015; Selby, 2015; Wals, 2015; Huckle, 2017; Sterling, 2017) questions conceptions of weak sustainability and the attachment to economic growth that is reflected in the educational equivalent of the SD discourse. This thesis argues that the degrowth discourse, as a radical transformative stream of SD, also provides fruitful insights for the critical ESD debate. The main question of this thesis focuses on what ESD can learn from the degrowth debate.

This thesis' empirical approach builds on critical ethnography. In a qualitative approach, the perspectives of 11 ESD and degrowth experts, and of 17 learners in the field of non-formal adult education were studied with a view to understanding which knowledge elements, competency components and pedagogical approaches from the degrowth debate should be integrated into ESD. The results indicate that, in particular, knowledge elements about the *causes of unsustainability and barriers to sustainability*, as well as *change and strategies towards sustainability*, should be central to degrowth-informed ESD. In terms of competency components, the *abilities to reflect and criticize the economic growth paradigm and capitalism* - on a *societal* but also on the *personal* level, as well as the *abilities to unlearn and to resist cultural practices* that relate to *economic growth* and *capitalism,* are crucial. Key pedagogical approaches that work at *fostering critical reflection* and *fostering transformative action* become more effective when they are applied in a degrowth context.

This illustrates one of the key ways in which ESD can benefit from the degrowth debate. If ESD were to integrate certain aspects of degrowth, the resultant degrowth-informed ESD could furnish learners with the practical and mental abilities to not only challenge unsustainable assumptions and myths, but also to 'decolonize' the social imaginary (Latouche, 2015) from economic growth and capitalism. It can also aid the building of counter-hegemonic individual and collective educational practices and foster resistance to the reproduction of the growth paradigm. It enables learners to unlearn not only unsustainable lifestyles and behavior patterns but, by doing so, also applies pressure to the levers of political and social change, such as institutions, social structures and the economic system.

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Abbreviations

BRICS	Brazil, Russia, India, China und South Africa
CNCR	Constant natural capital rule
DESD	UN Decade of Education for Sustainable Development (2005-2014)
EE	Environmental Education
EfS	Education for Sustainability
ESD	Education for Sustainable Development
ESE	Environmental and Sustainability Education
GAP	Global Action Program on ESD
GDP	Gross Domestic Product
GL	Global Learning
OECD	Organization for Economic Co-operation and Development
PISA	Program for International Student Assessments
PBL	Problem-based Learning
SD	Sustainable Development
SE	Sustainability Education
SDGs	Sustainable Development Goals
TBL	Triple Bottom Line
UN	United Nations
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCED	World Commission on Environment and Development

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1 Introduction

Over the past few centuries, the relationship between human economic activity and the ecological foundation[1] upon which it acts and is based has grown increasingly unsustainable. From the 1960s onwards, social movements and politics began to display a genuine concern for the environment in their agendas. Today, evidence from climate science shows that anthropogenic impact on the Earth's systems is the dominant cause of observed warming that has been occurring since 1950 (IPCC, 2014, p. 5). Beginning slowly over the past few centuries, before seeing an exponential increase after the Second World War, this unsustainable interaction between humans and their environment has led to a great acceleration in certain Earth system trends (Steffen et al., 2015b, p. 11, see Fig. 1). Steffen et al. suggest that Earth system trends, such as the carbon dioxide or nitrous oxide concentrations in the atmosphere, or the Earth's surface temperature, are and have been on the rise since industrialization. They suggest also that the rise in atmospheric carbon dioxide concentration displays a strong correlation to the rise in both GDP and primary energy use (Steffen et al., 2015b, p. 9). At the same time, the main trajectory of socio-economic trends globally predict that aggregated and total economic activity on the globe will continue to grow at a rapid rate (ibid., 1).

Earth system scientists have drawn inspiration from such global interconnections and suggested some central concepts to define and contour the dimensions of unsustainability. Referring to humans' geological imprint on the planetary system, Nobel laureate Paul Crutzen suggested naming our current epoch 'the age of mankind' or the 'Anthropocene' because according to him, human beings are the decisive species influencing geological and planetary processes (Crutzen, 2002, p. 23). However, while most of the population growth since 1950 has occurred in the non-OECD world, the world's GDP and consumption is still dominated by OECD countries (Steffen et al., 2015b, p. 1). The socio-economic trends of the great acceleration indicate that most of the human impact on the earth system trends comes from OECD countries (ibid., 2015b: 11).

Therefore, the issue of equity and justice must be at the center of any reflections on how to save and conserve the ecological foundation for the future. This includes political questions of distributive justice between rich and poor, Global North and South.[2] The issue of distributive justice will have to be central to political considerations, if the preservation of the Earth's remaining resources is to be seriously considered from a global perspective.

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[1] By "ecological foundation", what is meant is the environmental basis of all life and human activity, what in German would be *termed ökologische Grundlagen*.

[2] Consequences of the changes in the earth system have to be considered in the context of global inequalities and the distribution of benefits and disadvantages. The term Anthropocene refers to the human species as a whole. Critical perspectives on the Anthropocene from social sciences and degrowth authors are described in chapter 2.3.

An international group of researchers aimed to define a "safe operating space for humanity" (Rockström et al., 2009, p. 31), by identifying global environmental problems and their safe/dangerous dispositions. This resulted in the concept of nine 'Planetary Boundaries' (ibid.; Steffen et al., 2015a). Each of the boundaries has a defined safe space, an area of uncertainty, a climatological tipping point and an area of high risk where the boundary is identifiably being crossed (Steffen et al. 2015a, p. 736)[3]. This global framework is especially applicable for contemporary political negotiations exploring how to shift away from severely unsustainable interactions with the ecological foundation towards sustainability.

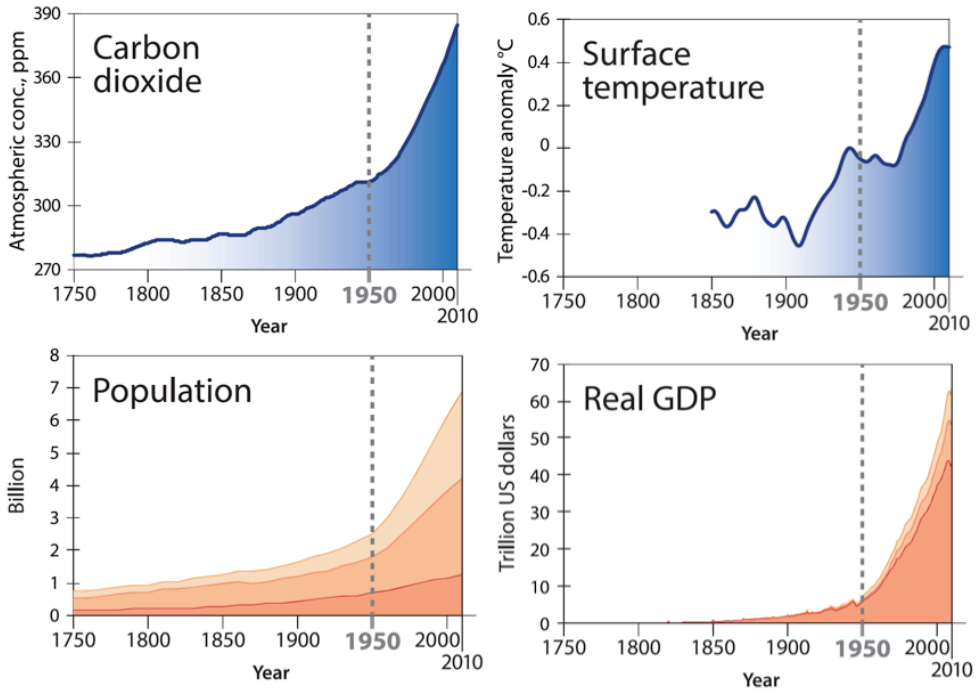

Fig. 1: Examples of earth system trends and socio-economic trends: Carbon dioxide concentration in the atmosphere, surface temperature and population and real GDP (the latter socio-economic trends are differentiated in OECD countries [dark red], BRICS countries [medium red] and others [light red]) (Figures from Steffen et al., 2015b).

Sustainable Development and Education for Sustainable Development

Sustainable development (SD) as a guiding principle in its contemporary application has enjoyed a spectacular rise in popularity over the past three decades.[4] Its rise began with the first United Nations Conference on the Human Environment in Stockholm[5] in 1972.

The goal of the emerging environmental endeavor by the UN was to protect the environment from degradation and to limit industrial pollution.

[3] For three boundaries, the zones are not quantified yet. They are: Atmospheric aerosol loading, novel entities, and functional diversity (biosphere integrity) (see Steffen et al., 2015a, p. 736).

[4] However, John Evelyn was first to introduce the concept of 'sustainability' in England (*Sylva – or a Discourse of Forest-Trees and the Propagation of Timber*, 1662) and Hans Carl von Carlowitz in Germany (*Sylviaculture oeconomica, oder haußwirthliche Nachricht und Naturmäßige Anweisung zur wilden Baum-Zucht*, 1713) in the context of forestry, before it gained broader attention after the Brundtland report.

[5] https://sustainabledevelopment.un.org/milestones/humanenvironment, *Date of access: 31.05.2019*.

Simultaneously, and in a manner directly contrary to this goal (see section 2.1.1), governments from the Global North and South aimed at 'development' and economic growth[6] for their economies (Sachs, 2010a, p. 26; Michelsen et al., 2016, p. 8).

The broadly acknowledged solution to this contradiction was provided by the World Commission on Environment and Development (WCED), also known as the 'Brundtland Commission'[7]. In 1987, the Brundtland Commission released its final report (WCED, 1987). It stated that: "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (ibid., p. 16). With this Brundtland definition, the commission succeeded in defining development in a way that it combined the aforementioned conflicting ideals of environmental protection and social and economic 'progress' in favor of poverty reduction.

The success of the 'Brundtland report' (WCED, 1987) was to put sustainable development on the international political and scientific agenda. Following the Rio Conference[8] in 1992, several years after the report, the guiding principle of sustainable development was included in political documents such as Agenda 21 (UN, 1992b). During this time, political endeavors in favor of SD were increasing. A recent success was the Paris Agreement in 2015[9]. This agreement led to the political implementation of sustainable development in highly influential guidelines for international politics, in particular the seventeen Sustainable Development Goals (SDGs) (UN, 2015). The SDGs' underlying document, the '2030 Agenda', claims that "[w]e are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path" (ibid., p. 4).

It is not only in the political sphere, but also in the educational sector that this implementation has been taking place. The educational arm of SD, Education for Sustainable Development (ESD), is often considered to play a crucial role in the sorely needed process of socio-ecological transformation (see *e.g.* Wals, 2011; Stoltenberg & Burandt, 2014, p. 573; Barth, 2015) not only on the educational but also on a broader societal level (UNESCO, 2014c, p. 12).

There is no fixed definition of what ESD actually entails. However, one example of an official description of the aims of ESD is given by UNESCO below:

> *"ESD empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning, and is an integral part of quality education. ESD is holistic and transformational education which addresses*

[6] In a recent review article on degrowth, Kallis et al., summarized economic growth as "an integrated cultural, political, ecological, and economic process manifested in an increase in the total market value of all goods and services (GDP)" (Kallis et al., 2018, p. 4.2)

[7] The Commission was contracted by the United Nations and chaired by the former Norwegian Prime Minister Gro Harlem Brundtland.

[8] https://sustainabledevelopment.un.org/milestones/unced, *Date of access: 31.05.2019*.

[9] https://www.un.org/sustainabledevelopment/cop21/, *Date of access: 31.05.2019*.

learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society."
(UNESCO, 2014c, p. 12)

As SD has grown in influence in international and national policies, its educational arm, ESD, has kept pace with this trend of increasing political visibility. The first step towards mainstream political recognition of ESD was achieved when education became a central focal area for SD in the Agenda 21 (UN, 1992b, p. 320; see also UN, 2012, p. 44). Following the Rio+10 conference in Johannesburg, the UN Decade for ESD (DESD) (2005-2014) led to increased recognition of sustainability themes in all education sectors (see UNESCO, 2014a, p. 30).

The success in implementing ESD worldwide by the DESD was then furthered by UNESCO's 'Global Action Program' (GAP) post-2015 (UNESCO, 2014c; 2017b). The stated aim of the GAP is, in "five priority areas […] to launch and intensify initiatives in all areas of education, supporting and advancing the process leading towards sustainable development" (Michelsen & Wells, 2017, p. 9). These priority areas include (1) "advancing policy" (including mainstreaming in policy-making), (2) "transforming learning and training environments", (3) "building capacities of educators and trainers", (4) "empowering and mobilizing youth" and (5) "accelerating sustainable solutions at local level" (UNESCO, 2014c, p. 15). Furthermore, one of the GAP's goals is to ensure the SDG target 4.7[10] is met by 2030 (UNESCO, 2017b, p. 13).

The anchoring of ESD in particular with the SDGs (UN, 2015, p. 21; see also UNESCO, 2017a) can be seen as biggest political milestone so far for the ESD community. However, the 'Incheon Declaration' for the implementation strategies of SDG 4 points out that: "While considerable progress has been made in recent years, only 50% of UNESCO's Member States indicate that they have, for example, integrated ESD into relevant policies" (UNESCO, 2016, p. 49). Thus, aiming to meet the SDGs also represents the most powerful societal mandate for ESD in recent years (see Sterling et al., 2017, p. 156).

Socio-ecological transformations with or without growth?

Fortunately, today, the ecological and social symptoms of unsustainability, such as climate change, injustice and inequality, are widely recognized. However, SD remains a contested concept. There might be consensus in regards to the identification of environmental symptoms, but there is by no means a consensus regarding the measures and strategies necessary for overcoming unsustainability (see Giddings et al., 2002, p. 187). Different conceptions of SD often align with specific economic ideas. For instance, official positions on

[10] "4.7 – By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development" (UN 2015, p. 21).

sustainable development, best encapsulated in the Brundtland definition, uncritically accept the maxim of continuous economic growth. Such ideas can be assigned to neoclassical economic theory (see Deutscher Bundestag, 2013, p. 364).

Conflicting conceptions of SD and the unsolved issue of the future of economic growth and its relation to SD are major controversies in the sustainability discourse (see Grunwald & Kopfmüller, 2012, p. 53). The question remains as to whether and how continuous economic growth can be combined with the guiding principle of sustainability (see ibid.).

A growing number of researchers from the social sciences (*e.g.* Rosa, 2013b; Altvater, 2016; Moore, 2016; Schmelzer, 2016), Earth sciences (*e.g.* Rockström et al., 2009; Steffen et al., 2015a; 2015b) and economics (*e.g.* Daly, 1991; Seidl & Zahrnt, 2010; Paech, 2012) now question the role of economic growth as an underlying principle of societies. Such researchers, as well as activists, are trying to combat the ignorance of socio-ecological consequences of steady economic growth. From such perspectives, the rather teleological idea of endless growth is held to be profoundly contradictory.

Long before the recent contributions from Earth science and even before the term SD was born, some core publications, such as Rachel Carson's book *The Silent Spring* (Carson, 1962) and the report "The Limits to Growth" by the Club of Rome (Meadows et al., 1972)[11], influenced the emerging environmental movement to draw attention to the role of continuous economic growth. Such contributions identified economic growth as a key cause of unsustainability and devastating climate change (Meadows et al., 1972; Gorz, 1980; Daly, 1991). The early public and scientific debates shifted to questions of how humanity in general and societies in particular interact with the global ecological foundation. A fundamental explanation of interactions between the economy and the ecological foundation was formulated by Nicholas Georgescu-Roegen. In his book *The Entropy Law and the Economic Process* (1971), Georgescu-Roegen applied the laws of thermodynamics to the economic process. According to Georgescu-Roegen, all natural resources are irrevocably degraded when put into economic activity (ibid., p. 6).

In summary, evidence from Earth science and ecological economics clearly indicates that continuous economic growth and resource depletion are at the heart of unsustainability. Nevertheless, economic growth is still widely considered the guiding principle for the majority of economic activities globally. Even international sustainability declarations are geared for growth (WCED, 1987; UN, 2015, p. 6) and mainstream economics still holds fast to the dogma that growth is good. The beliefs and ideologies steeped in

[11] See also Kenneth Boulding 1966: "The Economics of the Coming Spaceship Earth".

neoclassical theory are so strong that growth has become paradigmatic for the majority of societies around the globe (Schmelzer, 2015b, p. 267).

The question of growth also matters for ESD because ESD is often described to be part of socio-ecological transformations. However, in official ESD documents, such as in the definition of ESD above, it is often not specified whether such transformations are in favor of continuous economic growth or not. Many descriptions of ESD are conceptually very open. This conceptual openness has the advantage of providing "an integrative framework that has the potential to forge alliances between different adjectival educations" (Fischer et al., 2016, p. 145).

Thus, unsurprisingly, ESD today enjoys a high reputation and mainstreaming in educational debates. The UNESCO chairs of ESD reflect on its current state as follows:

> *"If ESD was once seen as more of a niche activity in a greater educational system, this viewpoint has now shifted. Today education for sustainable development is seen as an innovative concept that gives a new meaning to teaching and learning in many different educational settings. Education for sustainable development is no longer an 'add-on' in the curriculum alongside environmental, consumer or climate education; instead it is an approach offering an opportunity to fundamentally rethink education."*
> *(Michelsen & Wells, 2017, p. 8)*

Not only the political visibility of ESD, but also its visibility in educational policies and systems is continuously increasing. Indicators in the GAP's halftime report suggest that the implementation of ESD in educational programs is also trending sharply upwards. By 2016, 2.4 million learners were reported to be in ESD activities globally. The GAP's goal is to reach 3.3 million by 2019 (UNESCO, 2017b, p. 8).

A brief glance at the degrowth movement

Critical discussions about the future of economic growth are quickly gaining momentum (*e.g.* Martinez-Alier et al., 2010; Demaria et al., 2013; D'Alisa et al., 2015; Jackson, 2017; Kallis, 2017a; Raworth, 2017a) in both the academic and lay communities[12]. These growth-critical communities acknowledge that global sustainability and socio-ecological transformation will need to find alternative 'development' pathways beyond the paradigm of growth. "The paradigmatic proposition of degrowth is […] that human progress without economic growth is possible" (Schneider et al., 2010, p. 512).

Although the community shares a fundamental critique of growth, the schools of thought among growth-critical intellectuals are very diverse (*e.g.* Schmelzer & Passadakis, 2011; Seidl & Zahrnt, 2012; Schmelzer 2015a; Seidl & Zahrnt, 2016, see section 2). Although such discussions are increasing, they

[12] The 2018 movement looks back not only on several international degrowth conferences with a rapidly increasing number of participants, but also on a vivid scene of activists and countless local initiatives and emancipatory alternatives.

are still a niche even in the SD debate and up to now their influence on politics is minor.

The critique of capitalism and its links to the growth paradigm is especially common in the *degrowth* movement in the narrower sense (see section 2.3). This large degrowth community within the growth critical debate emphasizes that growth criticism cannot be separated from a fundamental criticism of the capitalist social system (*e.g.* Muraca, 2013; 2014; Kothari et al., 2014; Schmelzer, 2016; Brand & Wissen, 2017a; Kallis, 2017a). As early as 1980, social philosopher André Gorz suggested that „capitalist growth is in crisis not only because it is capitalist but also because it is encountering physical limits" (Gorz, 1980: 11).

In its critical and transformative perspective, degrowth builds on broader social science traditions and demands a consistent normative positioning with regards to justice, equality and care. This thesis is informed to a large degree by the transformative degrowth debate.

Aim of the Study

Although SD and ESD might still be alien concepts to the majority of people, the past few decades have seen an ever increasing amount of attention being paid to ESD. Nevertheless, it is constantly in flux and is greatly influenced by developments in the SD discourse. However, it is not yet clear how ESD relates to the debates surrounding the future of economic growth.

Growth-critical scholars such as David Orr, whose work has inspired that of many other critical ESD scholars (e.g. Wals, 2015, p. 28; Wals et al., 2017, p. 25), would argue that the existing forms of education need rethinking and reconstruction.

"The truth is that without significant precautions, education can equip people merely to be more effective vandals of the earth"
(Orr, 2004, p. 5)

"and of each other"
(Orr, 2017a, p. x).

Such "significant precautions" (Orr, 2004, p. 5) refer to the fundamental rethinking of education (e.g. Michelsen & Wells, 2017, p. 8). This has been undertaken in recent decades by a critical community of ESD researchers (e.g. Huckle, 1991; 1993; Jickling, 1992; Sterling, 1996; Fien, 2001). This critical ESD community condemns, for instance, the paradigmatic imprint of neoliberal agendas and economic growth on ESD research and policies (e.g. Selby, 2010, p. 38). They argue that mainstream ESD fails to challenge either neoliberal educational agendas or 'weak' sustainability. Furthermore, the community argues that another paradigm is necessary, not only on the societal but also on the educational level (see Sterling, 1996).

Degrowth brings a comparatively new perspective to the general SD debate, offering various promising approaches for positive socio-ecological transformations beyond the paradigm of growth. Although the *critical* ESD community has worked hard to incorporate a variety of critical perspectives, that of degrowth has thus far only been considered by ESD scholars to a very limited extent. This relatively unexplored link between degrowth and ESD gave rise to this study.

This thesis therefore intends to explore this link further and consider *what ESD can learn from the degrowth debate*. This aim and motivation also functions as the main research question (MRQ). Degrowth is the analytical perspective of this study used to reassess parts of the ESD debate. In doing so, this study hopes to contribute to strengthening the theoretical and empirical interconnections between degrowth and ESD.

Overview of the Study

This study's theoretical and empirical approaches will be briefly discussed together below. Each chapter has a separate research question (see Fig. 2 below). Each contributes to an aspect of the main research question: What can ESD learn from the degrowth debate?

The theoretical part of the study includes one chapter on degrowth, which is the analytical perspective of this study (chapter 2). This chapter will explore the fundamental question of what the degrowth debate is about (RQ1) and trace the contours of the discourse. The next theoretical chapter focuses on the state of critical ESD discourse, and provides insights into critical pedagogy (chapter 3). This chapter will investigate the extent to which ESD has been informed by the degrowth debate so far (RQ2).

Building on these two chapters and their theoretical insights, the research gap will be outlined in detail. Subsequently, the remaining research questions will be introduced and explained with regard to how they were developed based on the research gap. Here is a brief outlook on the empirical part:

The empirical study design encompasses 17 case studies and interviews with young adults in four different, mainly non-formal ESD programs that are informed by degrowth, as well as focus group research with degrowth and ESD experts.

Within the ESD discourse, commonly discussed conceptual questions are often concerned with identifying the knowledge elements, competency components and pedagogical approaches that are useful for the learning process in the context of sustainability. Conceptual contributions can be used for educators to plan and design their learning environments and educational interventions. In light of the MRQ – what ESD can learn from the degrowth debate – such contributions should be reconsidered from the perspective of degrowth.

Subsequently, in both the case studies and the experts' research, the following three questions will be investigated: Which knowledge elements (RQ3), competency components (RQ4) and pedagogical approaches (RQ5) from the degrowth-informed educational practice should be integrated into ESD?

These three chapters (5-7), in which detailed aspects of ESD will be considered and discussed both theoretically and empirically, will be followed by a methods' reflection (section 8.1). This will be followed by the discussion of the main research question in light of the main findings of this work (chapter 8.2), before coming, finally, to the conclusions drawn (chapter 9).

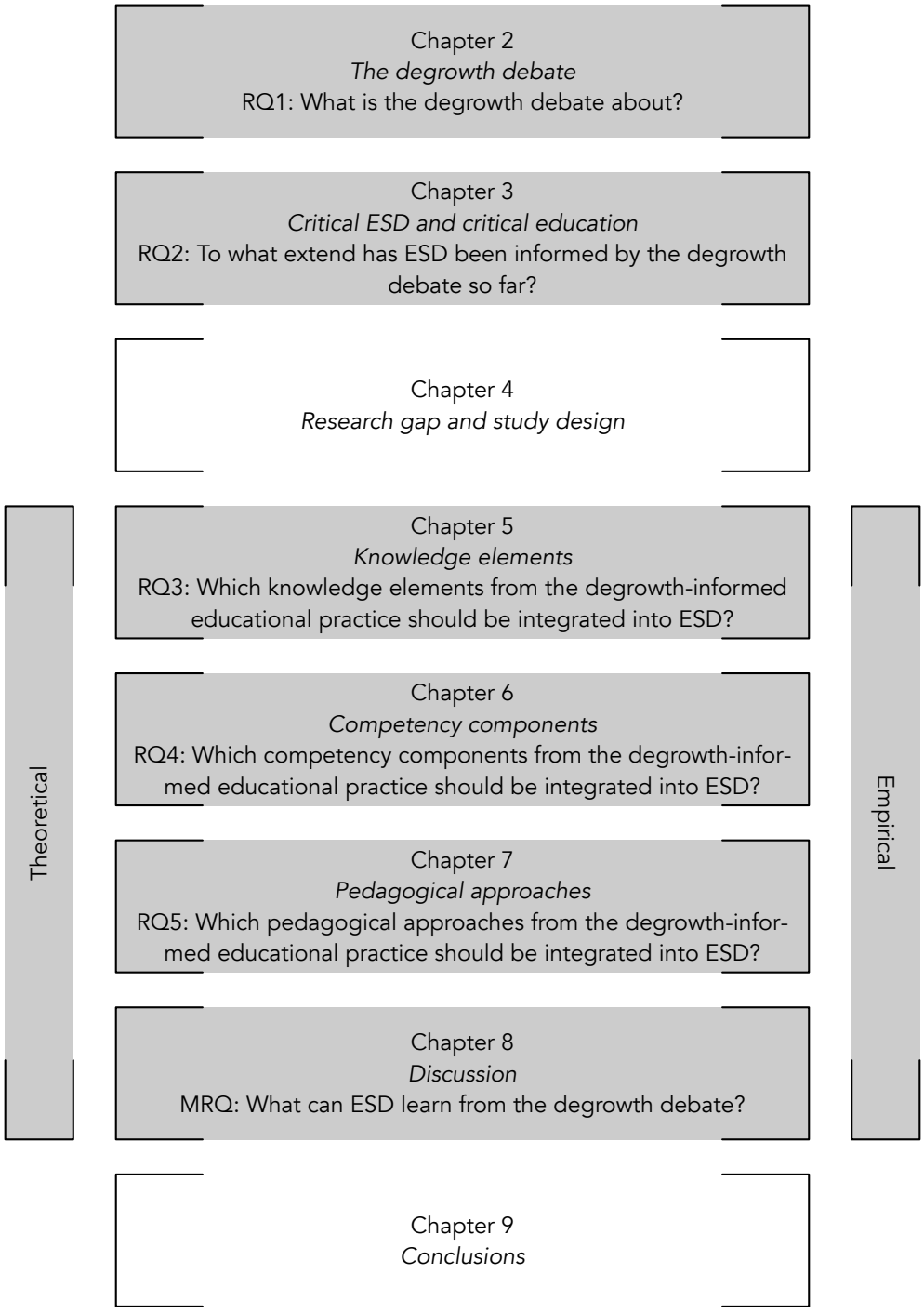

Fig. 2: Overview of the Study

2 The Degrowth Debate

Discussions about the negative effects of economic growth have gained momentum quickly in recent years[13] (e.g. Weiss & Cattaneo, 2017; Kallis, 2017a; Paulson, 2017). However, an increasing number of voices are calling for viable alternatives to the growth paradigm. In a recent review article for instance, a group of authors stated the case for degrowth: "Put simply, the degrowth hypothesis is that it is possible to organize a transition and live well under a different political-economic system that has a radically smaller resource throughput" (Kallis et al., 2018, p. 4.2).

Degrowth is popular in many western European countries and its popularity has already spread from southern Europe via northern Europe to the English-speaking world (see Muraca, 2013, p. 148). The academic discourse on degrowth has its origins in French cultural critique (e.g. Gorz 1980; Latouche, 2009; 2015) and social and environmental activism (see Demaria et al., 2013, p. 191). The different foci of the growth-critical debate go well beyond the 'umbrella keyword' of degrowth (Kallis, 2011, p. 874): '*Décroissance*', '*Descrescita*', '*Degrowth*', 'steady-state' and '*Postwachstum*' are terms that are used in different countries and languages and which also emphasize theoretical differences that align with each respective term[14]. Different approaches explain, structure and systematize the scientific discourse on growth critique (e.g. Schmelzer & Passadakis, 2011; Seidl & Zahrnt, 2012; Schmelzer 2015a; Seidl & Zahrnt, 2016).[15] Scholars have also categorized the spectrum of grassroots degrowth activists, suggesting they reach from 'moderate immanent reformers' to 'eco-radical sufficiency-oriented critics' to the 'alternative practical left'[16] (Eversberg & Schmelzer, 2018, p. 245).

Growth criticism calls for *more* than simply decreasing global Gross Domestic Product (GDP). It tries to consider not only 'market oriented' sectors, but also most public sectors (see Seidl & Zahrnt, 2010; Jackson, 2017, pp. 239)

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[13] There is an increasing body of literature on different varieties of growth criticism, but especially for degrowth, the peer-reviewed literature (and other literature as well) has been rapidly increasing since around 2010 (Weiss & Cattaneo, 2017, p. 222).

[14] In this study, the label 'degrowth' is used for a critique of economic growth in a transformative perspective although various growth critical authors prefer other terminologies such as post-growth (e.g. Seidl & Zahrnt 2010; Jackson, 2017), steady-state (e.g. Daly, 1991; 1996) or none of the same (e.g. Raworth, 2017b). Such authors prefer a specific terminology, while in more general expressions 'degrowth' subsumes different perspectives. Similar to this, the biannual international degrowth conferences (https://malmo.degrowth.org/, *Date of access: 31.05.2019*) attract authors from different streams. Due to the challenge to adequately translate the French term '*Décroissance'* and also due to substantial justifiable criticism of the economic consequences of '*Schrumpfung*' or '*Wachstumsrücknahme*', especially in the German debate, terms other than degrowth are applied (see Muraca, 2013, p. 148) - in some cases intentionally to refer to different concepts than décroissance and degrowth, e.g. in the form of post-growth-society (Seidl & Zahrnt, 2010) or post-growth economics (Paech, 2017).

[15] The differentiation in this study is mostly orientated along the work of Seidl and Zahrnt (2012; 2016) because their differentiation takes the different international discourses into account. A differing order system, especially of the German debate, is undertaken by Schmelzer (2015a) when he divides the discourses into conservative (e.g. Miegel, 2010), social-reformist (e.g. Seidl & Zahrnt, 2010; Schneidewind & Zahrnt, 2013), sufficiency-oriented (e.g. Paech, 2012), critical of capitalism (e.g. Rätz et al., 2010; Schmelzer & Passadakis, 2011) and feminist (e.g. Bennholdt-Thomson, 2010).

[16] Eversberg and Schmelzer (2018) evaluated a study among the participants of the 2014 degrowth conference in Leipzig and came to the conclusion that the "degrowth spectrum" consists of five currents: (1) The "eco-radical sufficiency-oriented critics of civilization", (2) the "moderate immanent reformers", (3) a transitory group of "voluntarist-pacifist idealists", (4) the "modernist rationalist left" and (5) the "alternative practical left" (Eversberg & Schmelzer, 2018, p. 245).

and all the productive and reproductive domains that are often in the shadow of the market sector (see Kallis, 2015, p. 21).

Degrowth is both a social movement[17] and a concept (see Martinez-Alier et al., 2010, p. 1742). The "emerging academic paradigm" (Weiss & Cattaneo, 2017, p. 220) of degrowth makes use of ecological evidence (e.g. Rockström et al., 2009; Steffen et al., 2015a; 2015b) and its grounding in economics (e.g. Georgescu-Roegen, 1979; Daly, 1991) to introduce new concepts and perspectives to the social sciences, some of which will be discussed in the following sections.

This chapter on the degrowth debate aims to answer the first research question of this study: What is the degrowth debate about? The chapter consists of four theoretical sections and a conclusion to the overall chapter. The first section introduces three distinct but interconnected foundations of growth criticism (section 2.1). The second section clarifies how degrowth and growth-critical positions are to be located within the broader discourse of SD. It also highlights different conceptions of sustainability (section 2.2). The third section introduces degrowth in the narrower sense, as well as its critique of not only economic growth, but also capitalism. This includes opening up and identifying the analytical categories of growth as *paradigm*, *ideology and hegemony* (section 2.3). The fourth section introduces degrowth positions for socio-ecological transformations (section 2.4). Throughout this chapter, many details will be given that are important for understanding what the degrowth debate is about, although for the discussion not all of these will be of equal relevance or value to ESD.

[17] According to Snow (2004), social movements are "collective challenges to systems or structures of authority or, more concretely, as collectivities acting with some degree of organization (could be formal, hierarchical, networked, etc.) and continuity […] primarily outside of institutional or organizational channels for the purpose of challenging extant systems of authority, or resisting change in such systems, in the organization, society, culture or world order of which they are a part." (ibid., p. 11). This definition includes collective challenges to institutional, organizational and cultural domains and thus is suitable for the degrowth movement. It also brings to light the strong connection to aspects of resistance (see Asara, 2017, p. 173) implicit to the degrowth movement.

2.1 Origins and three foundational ideas of growth criticism

The different streams of discussions about degrowth tend to originate from the same tradition, which is sometimes called the 'first phase' of growth criticism (see Kallis et al., 2014, p. 2). As was mentioned in the introduction, this phase emerged in the 1960s and 1970s when an increasing consciousness of environmental problems at the global level led to an emphasis on resource limits (see ibid.). The report "The Limits to Growth" by the Club of Rome (Meadows et al., 1972) was released in this phase of increasing consciousness, and it marks, along with other progressive contributions, the beginning of the growth-critical debate.

The first phase of growth criticism is based on cultural theories such as a critique of technology (e.g. Illich, 1973) and economic reasoning (e.g. Georgescu-Roegen, 1971; Schumacher, 1973; Daly, 1991). Economic precursors to growth criticism have been formulated by progressive thinkers such as Georgescu-Roegen (1979, see below). Other important early economic contributions include Ernst Friedrich Schumacher's book *Small is Beautiful: A Study of Economics as if People Mattered* (1973)[18] and Herman Daly's *The Steady-State Economics* (1991), influenced by the work of his teacher, Georgescu-Roegen.

The next sections introduce three different ways of approaching growth-critical rationale. One such way is thermodynamics (Georgescu-Roegen, 1971; 1979), another is monetary theory (Binswanger, 2013; Bjerg, 2016) and the final theoretical approach takes us back to Marx' analysis of capitalism. Although each of the explanations can stand alone, all of them are fundamentally interconnected and reveal the complexity of growth criticism.

2.1.1 Thermodynamics, entropy and the economic process

As the introduction to this study points out, contributions to growth criticism from the Earth sciences indicate that there is a causative interrelation between the 'great acceleration' in socio-economic trends and certain Earth system trends (Steffen et al., 2015b, p. 9). The main driving force behind these trends are rapid growth rates in economic activity (see ibid., p. 1).

Nicholas Georgescu-Roegen (1979) was the first to use the French term 'Décroissance' in the context of thermodynamics and the law of entropy. His analyses still provide the foundation for much of the reasoning in ecological economics. In his 1977 essay "The Steady State and Ecological Salvation: A Thermodynamic Analysis", he compares 'standard (classical) economics' with mechanics. He points out that "standard analysis of the markets is all based on

[18] Schumacher (1973) argues that the modern economy is unsustainable because natural resources that are depleted are treated like expandable income instead of capital. Schumacher based his philosophical considerations on "a question of size" (Schumacher, 1973, pp.. 67) and therefore small units of 'enoughness'. This encompasses both natural resources and human needs (see ibid., p. 79). Schumacher can be understood as a pioneer in sufficiency debates.

complete reversibility from one equilibrium to another" (Georgescu-Roegen, 1977, p. 267), and argues that this is problematic because such understanding does not capture "the evolutionary nature of the economic process" (ibid.) and that such reasoning does not account for the manner in which natural resources actually function.

According to Georgescu-Roegen, economic activity degrades all natural resources irrevocably (1971, p. 6). Standard economics, however, operates on the assumption that it is possible to completely reverse the negative consequences of economic activity, especially the degradation of natural resources. This is perhaps best captured in his metaphor of a 'mechanical pendulum'. Georgescu-Roegen's application of the laws of thermodynamics to economics leads to an understanding of economic activity encapsulated in the image of a well-insulated 'thermodynamic' hourglass (Georgescu-Reoegen,1977, see Fig. 3) with two special features:

> *"Let the stuff inside that hourglass represent matter-energy. As in any well-insulated hourglass, the amount of this stuff remains constant at all times, which takes care of the First Law of Thermodynamics. […] But two important features distinguish our plastic representation from an ordinary hourglass. First, as the stuff pours down, it changes its quality. The stuff in the upper part of the hourglass represents available matter-energy […]. The 'stuff' in the lower part of the hourglass represents matter-energy which is unavailable in this sense. Second, the hourglass of the universe can never be turned upside down. These two special features express the essence of the Second Law of Thermodynamics, namely, that in an isolated system available matter-energy is continuously and irrevocably degraded into an unavailable state. Thermodynamic equilibrium is achieved when all matter-energy ultimately becomes unavailable"*
> *(ibid., p. 267)*

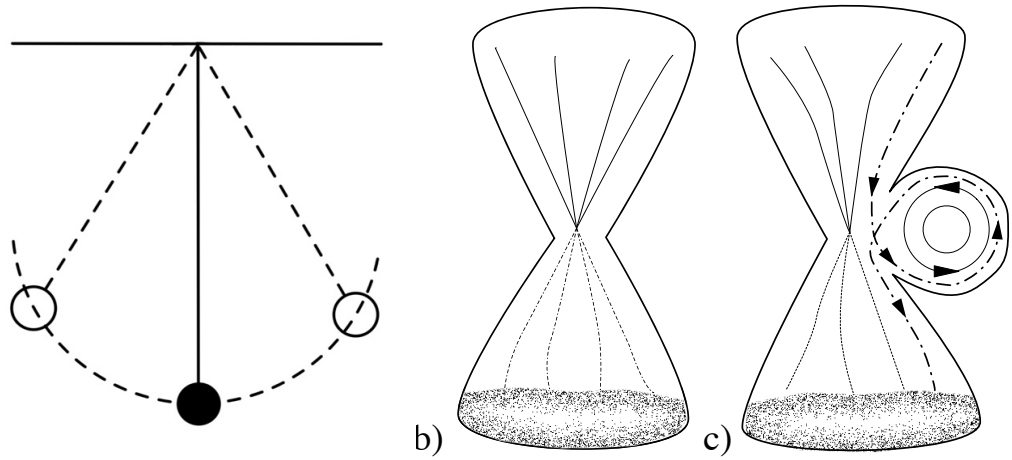

Fig. 3: a) "Mechanical pendulum",, b) "the hourglass of the universe" and c) "a closed steady-subsystem" (Figuress b and c adapted from Georgescu-Roegen, 1977, pp. 267).

Thermodynamics as applied by Georgescu-Roegen is useful for explaining how economic activity interacts with the natural resources upon which it depends. It demonstrates how resources (matter energy) can be processed from an available (useful for economic activity) to an unavailable state (useless for economic activity).

The logical assumptions represented in these different images have implications for human dealings with ecological resources. The irrevocable degradation of the natural resources and the relative level of unavailable matter-energy can be captured with an entropy index. In an isolated system, entropy continues increasingly to a maximum (see ibid.). Building on the definition of the Earth as a 'closed' subsystem, "a system that exchanges only energy with its environment" (see Fig. 3c), Georgescu-Roegen suggests, that in such a system, in which "the circular coil exchang[es] only energy with the universe hourglass" (ibid., p. 268) the matter remains constant over time within the system (ibid.).

The "entropic problem of mankind" (Georgescu-Roegen, 1977, p. 268) occurs due to the misleading assumption that, as long as (e.g. solar) energy input is unlimited, 'the work performed' is also unlimited" (ibid.). Georgescu-Roegen's argues that natural entropic degradation is a result of "the immense scale of the 'world engine'" – at such a scale, the dissipation of matter through "oxidation, chipping, blowing, and washing away" necessarily ends in "natural entropic degradation", the root cause of which is the activity of "all consumer creatures, especially […] humans" (Georgescu-Roegen, 1977, p. 268).

In summary, Georgescu-Roegens' analysis provides a strong theoretical foundation for ecological economics and growth critique in industrial societies, which are continuously "confronted with a decreasing accessibility to matter-energy in use". His work connects also to the social mechanisms of exploitation that cause natural degradation, through which "capital must necessarily be increased, and people must work harder". He concludes that, even though technological innovations might theoretically counterbalance the decrease in energy, the "weightiest difficulty is that such innovations cannot go on forever in a closed subsystem" (ibid., p. 270). As such, Georgescu-Roegen provides an early explanation for the limits of 'green innovations' and 'green growth'.

2.1.2 Growth imperative & growth impetus

Binswanger's monetary theory around what he calls the growth spiral is another possible approach to growth criticism. Binswanger[19] explains the demand for a minimum annual global growth rate of around 1.8% (Binswanger, 2013, p. 155). According to Binswanger "[o]ne important prerequisite for economic growth was the continuous replacement of barter by monetary exchanges, along with a simultaneous increase in the use of natural resources. In this way, the economic process was transformed into an open-ended upward-turning spiral."

[19] I would like to state from the very beginning that I am well aware that consensus among authors in the critique of economic growth by no means implies political consensus. The vast majority of growth critical authors, especially those supporting degrowth in the narrower sense (see section 2.3), share common 'leftist' ethical and political grounds. However, a number of spiritual, religious, simply dubious, conservative and regrettably even certain xenophobic people or initiatives criticize economic growth for different reasons. Such growth criticism is no "degrowth". I explicitly distance myself from any conservative, xenophobic or religious thought, as well as from notions that suggest or approve human population control in any way in the context of growth critical reasoning. This study focuses on growth critical authors' *scientific* reasoning.

(ibid., p. 153). The growth spiral is driven by dynamics between growth *imperative* on the one hand (see ibid., p. 116), and growth *impetus* on the other (see ibid., pp. 121). The growth imperative is considered to dominate the monetary dynamics that drive economic growth. It is explained as follows:

> *"Without a continuous expansion of the amount of money due to the need of financing new investments, which triggers additional demand, the increased supply of products due to the previous period's investments cannot be sold at prices, including profits, which compensate the risk of the investments. If the prices and the profits fall below the minimum level necessary for the compensation of these risks, firms will first reduce new investments but ultimately also replacement investments, entailing an absolute decline of the social product. This leads to a growth imperative in the sense that the alternative to growth is shrinkage and economic crisis."*
> *(Binswanger, 2013, p. 155)*

Additional dynamics of the growth impetus are explained as follows:

> *"Besides the growth imperative, there is, nevertheless, a growth impetus. This growth impetus essentially relates to the organization of firms as joint-stock companies. Shareholders of those companies have a strong incentive to reinvest a part of profits in order to increase their production capacity. This is due to the fact that the price of shares depends crucially on the expected increase of future profits. In turn, future profits depend on an increase in present production capacities. Since, in today's economies, economic activity is dominated by joint-stock companies, the rate of economic growth tends to exceed the critical minimum rate that is necessary for compensating investment risk. In other words, the growth impetus leads to a growth rate that exceeds the rate that is demanded by the growth imperative."*
> *(Binswanger, 2013, p. 155)*

Binswanger warns that there are internal and external barriers to growth that could make it an unstable phenomenon. Internal barriers are thosethat emerge out of speculative bubbles in financial markets, whereas external barriers are those relating to the exploitation of natural resources, including the distributive conflicts that result from such exploitation. However, he assumes that these external barriers to growth do not pose enough of a disincentive for the increasingly risk-prone activities of the financial world, which is often either ignorant or unconcerned with the ecological and social consequences of its activities (ibid., pp. 155).

2.1.3 Dynamics of capitalism, alienation & contradictions

"Capitalism is a system for producing ever greater quantities of commodities (goods and services) for sale at a profit, by incorporating ever greater quantities of human and non-human nature (workers and natural resources) into international circuits of money or capital" (Huckle, 2012a, p. 39). Binswanger's growth spiral (2013) is, by contrast, restricted to monetary theory on the growth imperative and impetus. The most extensive analysis of growth compulsion in capitalism was undertaken by Karl Marx. Based on the "tendency of capital (1)

continually to enlarge its own periphery of circulation; (2) to transform it at all points into production spurred on by capital" (Marx, 1858/1993, p. 408), Marx' general theory shows that capitalism *and* economic growth cannot be separated from each other:

> *"[T]he production of relative surplus values […] requires the production of new consumption; requires that the consuming circle within circulation expands as did the productive circle previously. […] Thus, just as production founded on capital creates universal industriousness on one […] so does it create on the other side a system of general exploitation of the natural and human qualities, a system of general utility. […]. For the first time, nature becomes purely an object for humankind, purely a matter of utility […] as to subjugate it under human needs, whether as an object of consumption or as a means of production. In accord with this tendency, capital drives beyond national barriers and prejudices as much as beyond nature worship […]. It is destructive towards all of this, and constantly revolutionizes it, tearing down all the barriers which hem in the development of the forces of production, and the exploitation and exchange of natural and mental forces."*
> *(Marx, 1858/1993: Grundrisse, Notebook IV, p. 409)*

Commodification & Alienation

As Marx suggests in the quote above, the expansionist dynamic of capitalism has consequences for both nature and what Marx calls "mental forces" (Marx, 1993, p. 409). Alienation is a central critical category in Marxist theory and tradition (see Memos, 2014, p. 80). According to Ollmann, Marx' theory of alienation refers to the imprint and effect of the operating modes of capitalism on people, including their psychological and physical condition and their social environment (Ollmann, 1976, p. 131). Ollmann argues that alienation can occur in one or more of four relations: in relation to one's own productive activity, one's product, to other people (social alienation) and in relation to one's own species (ibid., p. 136).

'Commodification', and what Polanyi calls "the commodity fiction"[20], (Polanyi, 1944, p. 72) is often linked to alienation. Polanyi defines this as a certain logic of assigning values to any kind of object or service independent from its actual form or its necessity. According to Polanyi, this affects the whole of society and almost all institutions and sectors (ibid.), including deeply humanistic sectors such as education or health. When we accept the 'commodity fiction', any useful thing or service is open to the market and available for a certain amount of money (see Gertenbach & Rosa, 2009, p. 188). As Singer points out, commodification is a key factor contributing to alienation. He explains that "[h]uman beings cannot be free if they are subject to forces that determine their thoughts, their ideas, their very nature as human beings". Singer

[20] "The crucial point is this: labor, land, and money are essential elements of industry; they also must be organized in markets; in fact, these markets form an absolutely vital part of the economic system. But labor, land, and money are obviously commodities; the postulate that anything that is not bought and sold must have been produced for sale is emphatically untrue in regard to them. In other words, according to the empirical definition of a commodity they are not commodities. Labor is only another name for a human activity […]; land is only another name for nature […]; actual money, finally, is merely a token of purchasing power […]. None of them is produced for sale. The commodity description of labor, land, and money is entirely fictitious" (Polanyi, 1944, p. 42).

also argues that, in the "materialist conception of history", people are "totally subject to forces they do not understand and cannot control". As a result, he concludes that alienation occurs because "[h]uman productive powers, instead of serving human beings, appear to them as alien and hostile forces" (Singer, 2000, p. 46).

Contradictions of capitalism and system change

David Harvey began contributing to growth criticism as early as the 1970s (e.g. Harvey, 1975), and has since then worked to explain capital's (geographical) expansionary tendencies (Harvey, 2014, p. 20) in line with Marx' general theory. According to Harvey, capitalism has inherent contradictions that have the potential to open up windows for transformation and system change. He argues that, due to its exploitative relationship to its own ecological foundations and due also to the impending environmental crisis, capitalism is currently potentially encountering a 'fatal contradiction' (Harvey, 2014, p. 246).

As Marx points out, the dynamics of capitalism usually result in an adaptive capacity to go beyond limits and barriers into its own transformed survival (Marx, 1993, p. 409). Nevertheless, Harvey suggests that three out of seventeen identified contradictions could potentially lead to an end of capitalism under certain circumstances. They are the three "dangerous, if not potential fatal, contradictions" (Harvey, 2014, pp. 220): "Contradiction 15: Endless compound growth" (ibid., p. 222)[21] inevitably leads to dangerous exponential growth; "Contradiction 16: Capital's relation to nature" (ibid., p. 246) engenders politically unresolved 'market failures', such as ignoring the real costs of economic activity in the form of ecological effects or 'externalities'[22] and finally, "Contradiction 17: The revolt of human nature: Universal alienation" (Harvey, 2014, p. 264).

According to Harvey, the latter of these, universal alienation, connects the other two contradictions to an actual potential for the end of capitalism via an "alienated human response to the kind of ecological system that capital constructs" (Harvey, 2014, p. 261).

> *"The colonization of our lifeworld by capital accelerates. The endless and increasingly mindless exponential accumulation of capital is accompanied by an endless and*

[21] "Compounding is, in essence, very simple. I place $100 in a savings account that pays 5 per cent annual interest. At the end of the year I have $105, which at a constant rate of interest becomes $110.25 the year after […]. The compound interest curve rises very slowly for quite a while […] and then starts to accelerate and by the end of the curve it becomes what mathematicians refer to as a singularity – it sails off into infinity" (Harvey, 2014, p. 224).

[22] "Ecological effects are typically experienced by capitalist firms as cost-shifting or as what economists call 'externalities' – defined as real costs for which capital does not have to pay (for example, the pollution that is unloaded into the environment or on to others free of charge). Even rightwing economists recognize that there is a problem of market failure here and that there is just cause for state interventions, compensatory taxes and regulatory action. […] The greatest danger is that necessary action will be delayed by recalcitrant political and corporate powers and that we might go beyond some irreversible tipping point before the problem is identified, let alone resolved. […] Capital is understandably not good at dealing with time horizons […]. This is one of the big problems with combating the long-term repercussions of climate change and the loss of planetary biodiversity" (Harvey, 2014, p. 254).

increasingly mindless extension of capital's ecology into our lifeworld. This provokes reactions, revulsions and resistances."
(Harvey, 2014, p. 262)

Harvey sketches a guiding image of 'unalienated human beings'[23] referring to basic values such as justice, solidarity, empathy and respect (ibid., p. 297). He is very optimistic about the potential of 'revolutionary humanism' to bring about a political praxis and advocates resolving each of the three contradictions in order to lead to meaningful systemic changes (ibid., pp. 282).

2.1.4 Synthesis for education: Origins and three foundational ideas of growth criticism

Although growth-critical perspectives arise from different points of views and in various disciplines, they all share a few key fundamental assumptions. The three foundational ideas of growth criticism - thermodynamics, the monetary system and the dynamics of capitalism - are not only crucial for the entire sustainability debate but are also of particular interest when considered in the *educational* context. Below are some brief suggestions as to how these foundational ideas might be applied for the educational context although educational issues will be discussed in much more detail in the following chapters.

Georgescu-Roegen's (1971; 1979) explanation of the fundament of ecological economics – that economic growth cannot go on forever due to the laws of thermodynamics – challenges the constraints of the economic and monetary systems that rely on growth. Our economies, depending on "barter by monetary exchanges" (Binswanger, 2013, p. 153) rely on a continuous growth rate and generally result in an ever *upward-turning spiral of growth* based on imperative and impetus (ibid.). A monetary system of that kind will necessarily force the planetary system to its ecological boundaries because it demands a continuous resource inflow. Based on this relation, infinite economic growth is simply not possible.

These two ideas offer perspectives that may be useful for education. For instance, the images of the mechanical pendulum vs. the hourglass of the universe offered by Georgescu-Roegen may form the visual basis for a more vivid intervention by educators. Such imaginary might help learners to understand the basics of ecological economics. Also, Binswanger's metaphor of the growth spiral could be applied to illustrate the complex monetary dynamics that are fundamental to economic growth. And the dynamics of capitalism based on Marx' analyses may shed light on the complexity inherent in the relationship

[23] "Unalienated human beings and unalienated creative personas emerge armed with a new and confident sense of self and collective being. Born out of the experience of freely contracted intimate social relations and empathy for different modes of living and producing, a world will emerge where everyone is considered equally worthy of dignity and respect, even as conflict rages over the appropriate definition of the good life. This social world will continuously evolve through permanent and ongoing revolutions in human capacities and powers. The perpetual search for novelty continues" (Harvey, 2014, p. 297).

between natural phenomena, economic activity and its social and psychological effects.

The critical categories of 'alienation' and 'commodification' that can be traced back to Marx' reasoning give further explanations of how and why the human labor force, in both the physical and mental sense, is depleted under capitalist production (see Ollmann, 1976). The attachment to continuous economic growth is not only causing resource depletion and perpetuating social inequalities, but also leading to people being psychologically alienated by the capitalist mode of production (see e.g. Ollman, 1976; Singer, 2000).

For the educational context, the interrelation of such dynamics must always be considered. Economic dynamics impact heavily on the psychology of the people involved in them. Consequently, educational interventions might perhaps focus on not only the economic phenomena that are foundational to the growth paradigm but also the connections between the psychological mechanisms and dynamics engendered by economic phenomena and the ways they impact on learners' daily lives.

Harvey has suggested how these interconnections can be captured as 'contradictions of capitalism'. Exponential growth rates, when combined with politically unresolved market failures, engenders both the colonization of life-world by capital and 'universal alienation'. In this interplay, these dangerous contradictions could be potentially fatal to capitalism when they provoke resistances and are responded to by 'revolutionary humanism'. Such 'revolutionary humanism' has the potential to bring about a different political praxis, one which may actually solve the contradictory relationship between capital and nature (Harvey, 2014, pp. 282).

Harvey's work could be useful for education if considered in the context of practical alternatives to the dominant economic paradigm. This could lead to education taking a more political role in society, perhaps fostering, for instance, political resistance and social movements. In doing so, education could go beyond individual and collective processes of reflection and play an active role in the political transformation of societies. The role of education in doing so will be considered in more detail in section 3.2.2.

2.2 Growth criticism and the sustainability discourse

For the analysis of the critical educational debate that will soon follow, it is necessary to understand the background to the debate on how degrowth relates to the broader sustainability discourse (SD). Some key aspects of SD are recurrent among the differing perspectives. Thus, the next chapters shall outline existing critiques of the term SD (e.g. Sachs, 2010a) and then suggest different approaches to classifying the various positions towards sustainability. Subsequently, different conceptions of sustainability are introduced. These different conceptions often align with equally divergent positions towards how transformation should look; these multifarious positions will also be outlined in the last part of this section. At the center of the critique is that these positions carry along problematic conceptions of 'green growth' and the attachment to the GDP as an adequate indicator of well-being.

2.2.1 Critique of Sustainable Development

Contemporary growth criticism began with "criticism of the hegemonic idea of 'sustainable development'" (Kallis et al., 2014, p. 2), which started with the 'Brundtland definition' (WCED, 1987, p. 16). In the introduction it was stated that the two goals driving the Brundtland commission – environmental protection and economic growth – were fundamentally contradictory from the beginning. The stated social and economic goals of the Brundtland definition included, for instance, the eradication of poverty, broad access to medical care, education and the establishment of vocational training (ibid.). Critics argue that such goals' main aim is to boost economic activity, which necessarily results in environmental degradation. Sachs suggests that the two conflicting ideals – environmental protection on the one hand and further economic 'progress' on the other – contradicted each other from the beginning of the contemporary SD debate (Sachs, 2010a, p. 26; see also Michelsen et al., 2016, pp. 8).

Although the 'Brundtland definition' as outlined in the introduction is well known, the sentences directly following the famed definition are likely unknown to many. These sentences clarify the understanding of the commission towards the limits to growth:

> *"The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth. […] Meeting essential needs requires not only a new era of economic growth for nations in which the majority are poor, but an assurance that those poor get their fair share of the resources required to sustain that growth."*
> *(WCED, 1987, p. 16)*

The concept of 'sustainable development' is perceived in many quarters as "new wine in old bottles" (Victor, 2008, p. 19). The Brundtland report gained

popularity because it succeeded in defining development in a way that, as Sachs puts it "could finally announce the marriage between craving for development and concern for the environment" (Sachs, 2010a, p. 26). Moreover, it was perceived as a way to combine both the cause and the cure in the same term, which is inherently contradictory. It is, however, a 'successful ambivalence' on the level of political implementation (see Sachs, 2010a, p. 28).

For critics, the term SD is problematic not only because of its contradictory treatment of the environment and economic growth, but also because of its development ideology. Sachs argues that the claim to abolish poverty was always the single most important pretense of the 'development ideology'[24]. However, "development remains what it has always been, an array of interventions for boosting GNP" (ibid., p. 28). Subsequently, the critique of SD is also based on post-development theories.

Such theories suggest that the term 'development' is always twinned with its opposite, 'underdevelopment'. According to Escobar, 'development' is grounded in the colonial logic that assigns the affluence model of the North to the 'underdeveloped' South (Escobar, 2015, p. 4). Harry S. Truman is identified as the inventor of underdevelopment in contrast to 'development' (Sachs, 2010b, p. xix): "We must embark [President Truman said] on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas." (cited in Esteva, 2010, p. 1). His famous inaugural speech in 1949 marks the 'era' of development (see Esteva, 2010, p. 1). Sachs suggests that assigning the Southern Hemisphere the label of 'underdeveloped' prepares the ground for political interventionism of the Global North in the Global South (Sachs, 2010a, p. xvi).

2.2.2 Concepts of sustainability

"There is such an overabundance of definitions, concepts, models and political strategies that it is not clear anymore whether the terms 'sustainability' and 'sustainable development' still bear any meaning."
(Ott et al., 2011, p. 13)

Since the Brundtland definition, the concept of sustainability in policy documents and many scientific publications has often been a three-dimensional[25] model (see Michelsen & Adomßent, 2014, p. 29) based on the three 'dimensions' of society, ecology and economy. Although there is a multitude of different conceptions and models of sustainability (see Michelsen et al., 2016, pp.

[24] The Brundtland report is criticized as applying the 'old development recipe': In the Brundtland report, the dynamics of poverty are described so: "[p]overty reduces people's capacity to use resources in a sustainable manner; it intensifies pressure on the environment" (WCED, 1987, p. 46). According to Sachs, the narrative is used to explain the need for more growth: "[S]ince growth was supposed to remove poverty, the environment could only be protected through a new era of growth" (Sachs, 2010a, pp. 27).

[25] Adding the cultural dimension, to ecology, economy and society, German sustainability researcher Stoltenberg (2010) suggests a four-dimensional model. The cultural dimension encompasses e.g. a human-nature relationships, and cultural norms and values to open up awareness for cultural practices such as consumption patterns etc. (Stoltenberg, 2010, p. 293). This four dimensional-model will be further referred to in chapter 4.

18), this thesis mainly refers to 'weak' and 'strong' sustainability (Ott, 2009; Ott et al., 2011). In its visual and metaphorical presentation, sustainability will sometimes be distinguished using the following models of sustainability: three-sectors, nested and multi-layered (Giddings et al., 2002, pp. 189).

Weak and strong sustainability

The fundamental difference between the conception of 'weak' and 'strong' sustainability is the role they see capital playing (e.g. nature, society). The two conceptions of sustainability part ways on the question of whether or not natural capital can be substituted by human or economic capital (see Ott et al., 2011, p. 18).

'Weak' sustainability holds that natural capital is merely one capital among others (e.g. social and economic capital). According to its logic, natural resources are, like all capitals, expressed in monetary terms (see Ott et al., 2011, p. 19). According to Ott et al. this logic assumes that ready substitutability among different types of capital exists as long as the cumulative total level of capital remains constant. This logic holds that, for instance, natural resources may be consumed as long as other capitals, such as the economy, are built up to compensate for the destruction of natural capital (see ibid.)[26]. Hediger emphasized the conceptual strengths of the concept of 'weak' sustainability due to the possibility of trade-offs: "Weak sustainability requires that the total value of aggregate economic activity and environmental quality should be maintained intact over time. […] This involves the possibility for trading off changes in environmental quality against changes in income, and vice versa" (Hediger, 2009, p. 36). Therefore, he sees no opposition between economic growth and environmental conservation, and argues that 'weak' sustainability could lead to a balancing of both (ibid., pp. 43).

'Strong' sustainability assumes limits of substitution between different types of capital. Daly argued that at least natural capital should be maintained at a constant level over time and not decline for future generations based on the 'constant natural capital rule' (CNCR) (Daly, 1996, cited in Ott et al., 2011, p. 19). Thus, from the perspective of 'strong' sustainability, the CNCR is a restriction imposed on economic and social change (see Ott, 2009, p. 51) based on the assumption that the ecological sphere, or natural capital, is non-negotiable and must therefore be seen as higher up on any hierarchy of importance.

Moreover, 'strong' sustainability is linked to a 'biospheric framing' (see Ott et al., 2011, p. 19), which regards nature as an "interlinked ecological background in which economy and society are embedded" (ibid. 19). In practical political application and communication, it is considered that the concept of 'strong' sustainability could be a powerful tool in combating the overemphasis

[26] The conception is similar to the Triple Bottom Line (TBL), a model that consists of three different substitutable spheres "people, planet, profit" (Elkington, 2014).

of the economic sphere in public discourse. Ott et al. suggest that the "use of frames, images and visions" (Ott et al., 2011, p. 23), such as alternative pathways of social organization or economic organization, could be a promising way of communicating this concept. They argue that such approaches can help to open up new 'storylines' which are needed to challenge the myths[27] and operating modes of institutions in favor of unsustainability (ibid., p. 23).

Critiques of the Brundtland definition often address the underlying concept of 'weak' sustainability (see next section). Advocates of 'strong' sustainability consider the substitutability of capital embedded in the concept of 'weak' sustainability to be a "bad compromise" (Ott et al., 2011, pp. 13) because of the fraught relationship between economic growth, planetary boundaries and social boundaries. 'Weak' sustainability aligns with the dominant neoclassic economic model that assumes that growth can be continuously created by the substitution of capitals (Deutscher Bundestag, 2013, p. 364). In this view, the ways in which that utility is created do not matter (see Michelsen et al., 2016, p. 19). Strong sustainability, on the other hand, is "the opposite of the neoclassical sustainability concept and was developed by the proponents of ecological economics" (ibid, p. 22).

Ott et al. suggest that while the broad framing of the sustainability concept allows for a diversified participation of stakeholders, "this vagueness also leaves it open to being misused by power groups who want to press their business-as-usual attitude into a new trendy setting" (Ott et al., 2011, p. 14). The theory of 'strong' sustainability therefore provides a framework with which to challenge not only the uncritical adoption of contested economic concepts upon which the idea of substitutability (see Ott, 2009, p. 56) is founded, but also the vagueness inherent in the concept of 'weak' sustainable development and the concomitant danger of collapse under the platitudes of its constantly enlarging 'umbrella' (see Ott et al., 2011, p. 23).

Three-sectors, nested or multi-layered sustainability

Giddings et al. suggested a differentiation between several views of sustainability: 'three-sectors, 'nested' and 'multi-layered' (Giddings et al., 2002, p. 187). The '*three-sector'* model (Fig. 4a) describes the logic found in most official publications and the concept of 'weak' sustainability (ibid., pp. 188). In this model, the three 'dimensions' – ecology, society and economy – are given equal priority, and ideally should be in equilibrium. In reality, however, this is rarely the case. One recent example of the political application of this conception is the manner in which the 17 SDGs are defined. They are described as "integrated and indivisible, and balance the three dimensions of sustainable development: the economic, social and environmental" (UN 2015, p. 5).

[27] The term 'myths' in the growth-critical context is based on Georgescu-Roegen's notion in his 1975 essay: "Energy and Economic Myths".

Giddings et al., suggest that it has the advantage of 'conceptual simplicity' which "makes analyses more straightforward" (Giddings et al., 2002, p. 189). It allows for trade-offs, which is, for advocates of this model, an advantage. Such trade-offs may include that some pollution is acceptable for increased growth (see Hopwood et al., 2005, p. 48).

For others, this is the weakness of the model. Giddings et al. suggest that the autonomy and substitutability of the sectors encourages 'technical-fix approaches' to sustainable development. Such 'technical fixes', including changing interest rates, taxation etc., are considered problematic. While they can be introduced as short-term band-aid solutions, they prevent a shift in policy priorities towards the core of the problem – issues such as the relation between nature and societies, power structures etc. (see Giddings et al., 2002, p. 189).

The authors point out that the 'three-sector model' leads to the familiar contemporary political reality of priority being given to the economy over nature and society. Therefore, in this model, the economy dominates the other sectors, which they see as characteristic of capitalism (see ibid., p. 190).

> *"Political reality gives primacy to the economy. This largely treats the environment and society as a resource to be exploited, both natural and human, and as a sink where problems are dumped, whether unemployment, ill health or waste. In contrast, the material reality is that the economy is dependent on society and the environment […]."*
> *(Giddings et al., 2002, p. 191)*

Giddings et al. suggest that it would be more accurate to present the relationship between economy, society and environment in a *nested* model (Fig. 4b). In such a model, the economy would be nested within society, and then society within the environment (ibid., p. 191).

Griggs et al. built upon this model to suggest an alternative way of prioritizing the SDGs along that nested-model understanding. According to them, an adequate conception of sustainability that is capable of capturing the challenges of the anthropocene could be re-defined as:

> *"Development that meets the needs of the present while safeguarding Earth's life-support system, on which the welfare of current and future generations depends."*
> *(Griggs et al., 2013, p. 306)*

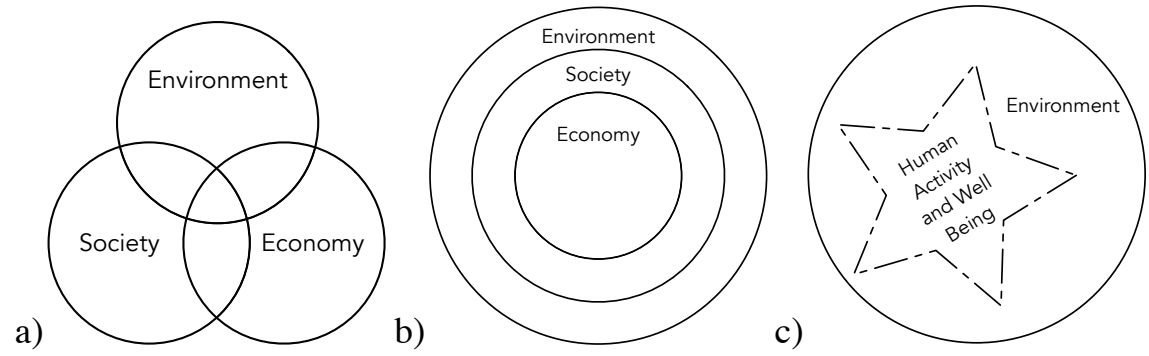

Fig. 4: a) 'Three-sectors', b) 'nested' and c) 'multi-layered' sustainability (Figures adapted from Giddings et al., 2002, pp. 189)

Connecting the 'nested' model to the abovementioned conception of 'strong' sustainability, Muraca and Döring build on Georgescu-Roegen's reasoning to emphasize that the relation between the three dimensions "is not simply a matter of concentric circles, but a dynamic and systemic interrelation" (Muraca & Döring, 2018, pp. 349). According to them, the circle of the environment not only encompasses the circles of the society and the economic processes, but represents creative transformations in an intersecting and temporal dynamic (ibid.).

This builds a bridge to the third suggested model by Giddings et al.. In this '*multi-layered'* model (Fig. 4c), it is acknowledged that three separated dimensions of environment, society and economy lead to 'over-simplification', even in a nested concept. In this model, human activity and well-being are integrated. According to the authors, multi layers enable dominant economic and social relationships to be challenged and the economy to be seen as a part of social activity and not as a separated construct (Giddings et al., 2002, p. 193). The authors acknowledge that this model still lacks conceptual strength, although it has the advantage of potentially counteracting alienation that occurs due to a separation of spheres of production and consumption (ibid., pp. 194).

2.2.3 Sustainable Development: Between status quo, reform and transformation

All the various conceptions, meanings and ideas of 'sustainable development' aspire to combine concern for the environment with socio-economic concerns, albeit with different emphases (Hopwood et al., 2005, p. 38). Hopwood et al. conducted a systematic mapping and classification of the different approaches (see Fig. 5).

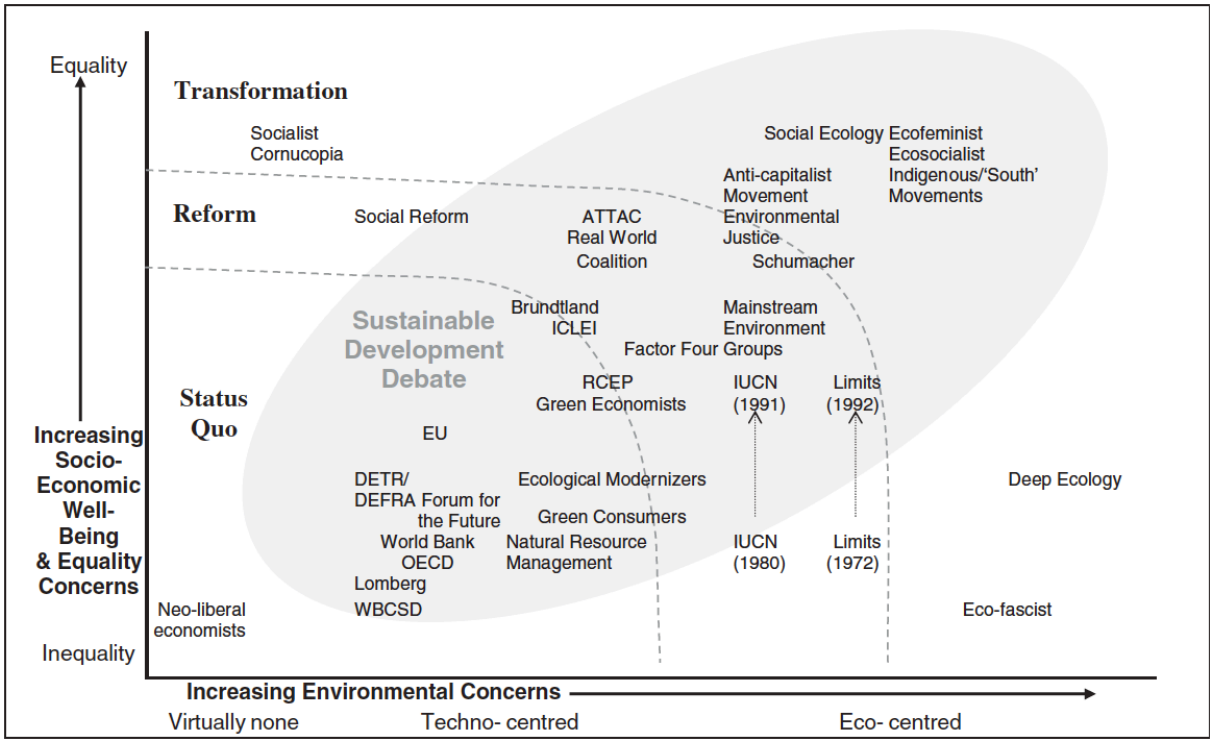

Fig. 5: Systematic mapping and classification of sources and authors of the different conceptions of sustainable development (Figure from Hopwood et al., 2005, p. 41).

Figure 5 shows that the different conceptions of sustainable development may be systematized along two axes. According to Hopwood et al.'s broad suggestion that all the different approaches to sustainability include both environmental and socio-economic concerns (Hopwood et al., 2005, p. 38), the socio-economic axis shows how much importance is given to human well-being and equality in each conception. The levels range between 'inequality' at one extreme and 'equality' at the other. The environmental axis shows how much importance is given to environmental concern. The levels here range from 'virtually none' to 'techno-centered' to 'eco-centered' (ibid., p. 41). The main criterion for classifying positions is the underlying model of sustainability (i.e., 'weak' or 'strong' (see ibid., p. 48).

The 'status quo' positions adhere to the idea of continuous economic growth as the solution, with there being no need felt for fundamental changes (ibid., p. 42). A low level of concern with regards to both axes is given to such positions (such as those held by the World Bank, OECD, EU, Green Consumers, etc.).

The 'reform' positions accept that both minor and profound changes are needed but that these changes can and will be achieved over time within the contemporary social and economic structures (ibid., p. 43). A medium level of concern regarding both equality and the environment is labeled as 'reform' (e.g. advocated by mainstream environment groups etc.).

In 'transformation' positions, the social and economic structures are seen as the root causes of unsustainability. Therefore, more drastic measures – 'transformations' – are considered to be necessary to prevent crises and

collapse. The authors suggest that 'transformation' is accompanied by high levels of concern in both areas. These positions are advocated by the anti-capitalist, environmental justice, ecofeminist, ecosocialist and indigenous movements) (Hopwood et al., 2015, p. 41).

The degrowth discourse in the narrower sense (see section 2.3) would also meet the criteria of the 'transformation' position (for a similar observation see Rieckmann, 2017, pp. 147). Many degrowth positions place a high level of importance on human well-being and equality on the socio-economic axis and they also give a high level of importance to eco-centrism on the environmental axis. Moreover, they operate on the assumption that the economic and power structures of societies are at the heart of the problem, and that changes in the political and economic structures of societies are therefore necessary (see Hopwood et al., 2005, p. 42; Muraca, 2013, p. 147).

2.2.4 Problems of 'status quo' and 'reform' from the perspective of degrowth

From the pro-transformation perspective of degrowth, the SD positions that align with 'status quo' and 'reform' are problematic. Such positions often come with ideas of 'green economy' or, as in the SDGs, "sustained, inclusive and sustainable economic growth" (UN, 2015, p. 23). Such definitions stem from an attempt to combine economic growth and sustainability. The OECD has recently developed "a new vision of growth and well-being" (Padoan, 2012). Here, prospective growth is supposed to become 'green' or 'inclusive' (ibid.). The re-definition of economic growth in sustainability-related policies is clearly noticeable, but the attachment to the paradigm of economic growth itself remains.

The most fundamental problem of all is that reforms are not enough because they would not change the social and economic power structures that are the drivers of the very system that causes unsustainability (see ibid., p. 45). According to Hopwood et al. 'reformers' would reject radical transformation positions, despite the fact that many years after Brundtland, the outlook on most Earth system trends is becoming bleaker by the day (Hopwood et al., 2005, p. 49).

Detailed examples of such 'status quo' and 'reform' positions that are problematic from the perspective of degrowth will be given in the following paragraphs.

Green growth, rebound effect and decoupling

Inherent in the idea of 'green growth' is the hope of decoupling resource use from economic growth (see Jackson, 2009, p. 67). Decoupling refers to "the

amount of materials in relation to economic output or in relation to economic impact." (Dittrich et al., 2012, p. 13).

Building upon the work of Georgescu-Roegen (1979) and the problem of entropy, decoupling is usually identified in the degrowth debate as one of the biggest 'economic myths' (see Bjerg, 2016, pp. 191). According to Haapanen and Tapio, the critique of 'greening' growth is central to degrowth. Degrowth distances itself from the widespread belief that decoupling or 'greening' could lead to a sustainable future without a fundamental system change (Haapanen & Tapio, 2016, p. 3494).

To a large extent, the problem of decoupling is connected to rebound effects.[28] Rebound effects (e.g. Berkhout et al., 2000; Polimeni et al., 2008; Madlener & Alcott, 2009; Santarius, 2016) arise from overcompensating saved resources, for instance by using more efficient technologies. In extreme cases, overcompensations can even lead to 'backfiring' in the sense of higher absolute resource use after introducing a more efficient technology.[29]

One complex example of a rebound effect concerns the cultivation of coffee. 'Conventional' cultivation of coffee has a bad reputation because of the clear negative social and ecological effects it has. The cultivation of organic and fairtrade coffee, however, was able to reduce these effects to a certain (limited) extent. The superior reputation of organic and fairtrade coffee led to boom in coffee sales in industrial countries, which in turn led to an increase in coffee cultivation. This feedback loop 'backfires', resulting in negative social and ecological impacts in coffee-growing regions.

Therefore in sum, absolute decoupling[30] of economic growth and resource use is hardly possible, but indeed relative decoupling[31] may be observed (see Seidl & Zahrnt, 2012, p. 7, based on UNEP, 2011).

Bjerg summarizes the line of argumentation of decoupling from growth-critical perspectives. He suggests that the standard critique acknowledges that decoupling might be a good idea but is simply not possible in practice (Bjerg, 2016, p. 191). He draws on the report on global material flows and use by Dittrich et al., who state: "From 1980 to 2008, material intensity of the world economy decreased by about a third. This is reflected by an increase in material productivity of 37%, as GDP grew faster than material consumption (147% vs. 79%)" (Dittrich et al., 2012, p. 34). Yet, Germany and Canada achieved absolute decoupling of resource use from economic growth during that period.

[28] Rebound effects are "defined as an increase in energy service demand due to an energy efficiency improvement" (Santarius, 2016, p. 406). They can occur in macro-economic effects and economy-wide, although they will always be caused on the micro-level by consumers or firms that consume (see ibid.). Rebound effect are also called the Jevons' Paradox (see e.g. Polimeni et al., 2008; Madlener & Alcott, 2009).

[29] Examples are cost reductions, coming along with a higher productivity and generating an increase in demand. According to Santarius (2015), rebound effects can occur on three levels: on the level of individual households and consumption patterns (micro-level), on the level of a whole economy (macro-level) and on the level of production-specific developments (meso-level) (Santarius, 2016, p. 406).

[30] "Absolute decoupling refers to a decrease in resource use or environmental impact in absolute terms." (Dittrich et al., 2012, p. 13).

[31] "Relative decoupling means that resource use or environmental impact is growing slower than economic output" (Dittrich et al., 2012, p. 13).

However, the authors of the report state that this does not support the idea of green growth but can be explained as the result of outsourcing material-intensive production to other parts of the world (see ibid.). Subsequently, Dittrich et al. conclude that there are "no signs of dematerialization (absolute decoupling) at the global level. The achieved efficiency improvements have therefore been over-compensated by economic growth." (ibid.).

Building on the insights from research on material flows (Dittrich et al., 2001) and the dynamics that were outlined in the section on thermodynamics and the 'problem of entropy' (Georgescu-Roegen, 1977), Bjerg concludes: "This is why decoupling is impossible" (Bjerg, 2016, p. 191).

As a result, for political processes, a German '*enquete*' commission on "Well-being, growth and the quality of life" (Deutscher Bundestag, 2013) worked systematically on the question of decoupling resource use from economic activity. The authors concluded in their final report:

> *"Due to the crossing of critical planetary boundaries, an absolute reduction of use of resources and sinks is necessary […], while at the same time avoiding merely shifting the problem […]."*
> *(Deutscher Bundestag, 2013, p. 476, my translation)*

In summary, from the perspective of degrowth, the belief or 'myth' of green growth is problematic because it would only shift the problem and not lead to an absolute reduction of resource use.

GDP and well-being

A second central point of discussion in the growth critical debate addresses the use of 'Gross Domestic Product' (GDP) as the conventional indicator for well-being. Central to the critique is the fact that, beyond a certain point, economic growth does not further increase the level of well-being (see Max-Neef, 1995, p. 117; Jackson 2017, p. 40) because a wage increase does not necessarily lead to higher subjective well-being (Easterlin, 1974, p. 118).

The critique is directed against the use of GDP as an indicator, because it does not map that global inequalities in wages and assets are steadily rising (Wilkinson & Pickett 2010a, pp. 4). Wilkinson and Pickett's study shows that, despite continuous economic growth in the Global North over the past few decades, the divide between rich and poor has increased (Wilkinson & Pickett, 2010b, p. 18). Debates around justice in the growth-critical community include the critique of unequal distribution. The aim is distributive justice within and across the Global North and South (Kothari et al., 2014, p. 369).

Growth-critical scholars therefore acknowledge that the GDP is not an adequate indicator for well-being (see Seidl & Zahrnt, 2012, p. 6) and many search for alternative measurements thereof, independent from an increase in GDP. The goal is a different (post-growth) macro economy that looks beyond

GDP for evidence of well-being (Jackson 2017, chap. 9). Alternative indicators that include parameters such as social cohesion, environmental quality, civic engagement or access to education and health institutions are developing and gaining recognition. One alternative example is the EU's initiative 'beyond GDP'[32], which is designed to address ecological and societal questions more inclusively. Another is the 'OECD Better Life Index'[33], which measures societal well-being based on various criteria such as education, environment, civic engagement and life satisfaction.

Other concepts that relate to the degrowth discourse from the Global South are Buen Vivir[34] (Gudynas, 2011) and Ecological Swaraj[35] (Kothari et al., 2014). Such concepts also build upon a fundamental critique of 'development' and suggest alternative worldviews beyond economic growth (see ibid., p. 366). Such approaches challenge the structural roots of inequality and unsustainability, including state power, capitalism, colonialism and patriarchy (see ibid., p. 364).

2.2.5 Synthesis for education: Growth criticism and the sustainability debate

The second section of this chapter introduced critiques of SD from growth-critical perspectives, different models and conceptions of sustainability, and the location of degrowth within the sustainability debate.

The critical insights of this section are useful for an educational context as well. As in the last synthesis, there will be some brief suggestions of how to practically address the critical SD debate in an educational context before going into more detail in the following chapters.

While the goals of continuous economic growth and poverty reduction seemed to be incompatible with environmental protection for many years, the 'Brundtland definition' provided a guiding principle that seemed to enable political debates that combined these goals. Since the birth of the 'hegemonic' idea of SD, the growth-critical discourse has suggested that in spite of the ecological mantle of the term, the core idea of 'development' has been utilized for continuous growth in GDP (see e.g. Victor, 2008; Sachs, 2010a) and the exploration of 'underdeveloped' markets in the South (see Esteva, 2010).

Educators could make use of this critical debate on SD to discuss the issue of sustainability in a controversial way. Examples could be roleplays that

[32] http://ec.europa.eu/environment/beyond_gdp/index_en.html, *Date of access: 31.05.2019*.
[33] http://www.oecdbetterlifeindex.org, *Date of access: 31.05.2019*.
[34] Buen Vivir or Vivir Bien is a concept from Latin America that describes alternative pathways of development and 'the good life'. "It is a plural concept with two main entry points. On the one hand, it includes critical reactions to classical Western development theory. On the other hand, it refers to alternatives to development emerging from indigenous traditions, and in this sense the concept explores possibilities beyond the modern Eurocentric tradition" (Gudynas, 2011, p. 441).
[35] Ecological Swaraj is a concept from India that emphasizes 'self-ruling' and 'self-reliance': It "is a framework that respects the limits of the Earth and the rights of other species, while pursuing the core values of social justice and equity. With its strong democratic and egalitarian impulse, it seeks to empower every person to be a part of decision making, and its holistic vision of human well-being encompasses physical, material, socio-cultural, intellectual, and spiritual dimensions" (Kothari et al., 2014, p. 368).

include the different motivations and political interests behind the development of the Brundtland definition of SD. Learners could develop their own positions and ideas of stakeholders and also minority groups in order to critically reflect on the political agenda behind the term.

Many philosophical efforts have dealt with the question of how a different conception of sustainability could lead to a shift in priorities between the different 'capitals'. One of these attempts is to create a picture of 'strong' sustainability that is not merely in favor of the economy and therefore contradictory to sustainability, but instead acknowledges the ecological and social limits to growth (see e.g. Giddings et al., 2002; Griggs et al., 2013). The 'Brundtland definition' is often assigned to the three-sectors model of sustainability, or the concept of 'weak' sustainability.

For education, the two different conceptions could, for example, be used to foster a basic economic knowledge on the theories behind such concepts. Basics of the neoclassical schools could be discussed alongside 'weak' sustainability in educational interventions while ecological economics could be discussed in the context of 'strong' sustainability.

The different conceptions of sustainability outlined above – 'nested', multi-layered' and 'three-sectors' – could be an interesting point of departure for education. Education that hopes to transcend unsustainable modes of thinking and patterns of behavior could make use of such conceptions for critical reflection. How do they influence the daily lives and consumption patterns of the learners? What changes may occur if the focus is shifted?

Distancing themselves from the assumption that 'economic growth' or 'development' *and* 'sustainability' are compatible, growth-critical and anti-capitalist positions are also located far away from 'mainstream' positions (Hopwood et al., 2005). Such 'mainstream' positions are identified as 'status quo' or 'reform' positions and they continuously apply definitions in favor of growth, such as 'green growth'. Growth-critical perspectives embrace the idea of 'transformation'. 'Status quo' and 'reform' are not enough if they do not challenge the underlying social and economic structures that are imprinted in the financial system and capitalist dynamic (see previous chapter) and if they do not shift the picture of sustainability.

The mapping of these different positions could be useful in education when trying to position oneself with the core arguments of a group. In an open-ended problem, learners could research on the different positions and present them for others while introducing the controversies that align with each position.

There are certain problematic conceptions that align with 'status quo' and 'reform' which crucially refer to the three foundations of growth criticism outlined above. Growth cannot be 'green' because, based on Georgescu-Roegen's analysis, absolute decoupling is considered to be impossible (see Bjerg, 2016) and has so far not been observed at a global level (Dittrichs et al.,

2012). Also, the assumption that continuous GDP is an adequate indicator for well-being has been rejected (Max-Neef, 1995; Jackson 2017). In summary, the attachment to the political idea of growth with no or little adjustment is incompatible with sustainability. Inequalities are continuously on the rise (Wilkinson & Pickett, 2010a) and ecological foundations endangered.

Educational programs might include reflections on these economic myths in order to challenge harmful assumptions and their contribution to unsustainability. In practical interventions such myths could be critical observed in the learners own life, for instance in the form of diaries and self-experiments to more consciously experience such patterns of harmful lifestyles.

2.3 Degrowth in the narrower sense[36] and critique of capitalism

"[W]hat are we really after? A capitalism adapted to ecological constraints; or a social, economic and cultural revolution that abolishes the constraints of capitalism and, in so doing, establishes a new relationship between people and nature? Reform or Revolution?" (Gorz, 1980, p. 44).

For authors writing about degrowth in the narrower sense, the deep roots of unsustainability are to be understood "as part of a multiple crisis of capitalism" (Brand & Wissen, 2017a, p. 159). Some early progressive intellectuals, such as social philosopher André Gorz, claim that although economic growth was supposed to ensure affluence for everyone, it has instead created needs faster than it could satisfy them, leading to a series of 'dead ends' such as capitalism's recent encounter with the biophysical limits to growth (Gorz, 1980, p. 11).

These dead ends are, according to Harvey, inherent to capitalism. As he argues, in order to resolve these contradictions of capitalism, it should first be understood that all environmental endeavors "must become anti-capital"[37] to be effective (Harvey, 2014, p. 252).

The introduction of this thesis traces how environmental and social 'dead ends', such as the 'great acceleration' (Steffen et al., 2011; 2015b), led to the age of the 'Anthropocene' (Crutzen, 2002). The term 'Anthropocene' indicates that the recent phase of socio-economic acceleration caused by humans has even intensified unsustainable practices, inequality and injustice (see Harvey, 2014, p. 178).

However, the term 'Anthropocene' is contested within the growth-critical discourse. Authors such as Jason W. Moore (2016) and Elmar Altvater (2016) make use of the concept of the 'Anthropocene' but both also criticize it as not tackling the core of the problem. According to these authors, 'humanity' or 'socio-economic activity' in general did not cause 'anthropogenic' climate change; rather, it was the fundamentally unsustainable mode of living that is both a symptom and the engine of the capitalist system, especially under the Western production model (see Brand & Wissen, 2017a, p. 153). Therefore, Altvater and Moore suggest the term 'Capitalocene' as a more appropriate term (Moore, 2016, p. 1; Altvater, 2016, p. 138)[38].

This debate is also part of the narrower degrowth discourse. Many authors point out that growth criticism cannot be separated from a fundamental

[36] In the differentiation of the discourses, Seidl and Zahrnt (2012, pp. 14; 2016, p. 9) assign a number of (heterodox) economists, such as Serge Latouche in France or Juan Martinez-Alier in Spain, to the degrowth school in the narrower sense – those authors use the term and label 'degrowth' actively. The German authors Matthias Schmelzer and Alexis Passadakis, with a "solidary post-growth-economy" (2011), or sufficiency-oriented economist Niko Paech, are also closely associated with the idea of degrowth (although Paech's approach is named "post-growth economy" ("*Postwachstumsökonomie*") (2012; 2017).

[37] "The environmental movement could, in alliance with others, pose a serious threat to the reproduction of capital. But so far environmental politics has not, for a variety of reasons, moved very far in this direction. It often prefers to ignore entirely the ecology that capital is constructing and nibble at issues that are separable from the core dynamics of what capital is about. Contesting a waste dump here or rescuing an endangered species or a valued habitat there is in no way fatal to capital's reproduction" (Harvey, 2014, p. 252).

[38] Donna Harraway (2016) goes even further, suggesting the term "Chthulocene" (Haraway, 2016, p. 35), named after a specific species of spider. Haraway thus applies a multispecies "tentacular" perspective that includes time dimensions of the past, present and future (ibid., p. 36).

criticism of the capitalist social system (e.g. Muraca, 2013, p. 165; 2014, p. 4; Kothari et al., 2014, p. 362; Schmelzer, 2016, p. 343; Brand & Wissen, 2017a, p. 159; Kallis et al., 2018, p. 410).

Such voices are explicitly critical of capitalism (see Schmelzer 2015a). However, the exact configuration of degrowth and its contemporary critique of capitalism is still being debated in the academic degrowth discourse (Kallis, 2017c, 1; Pineault, 2017, p. 12). Kallis et al. outline one central point of consideration regarding the potential socio-economic consequences of the rule of growth:

> *"Capitalist economies do undergo prolonged periods of zero or negative growth, but these have generally been undesired and unstable periods. Without growth, profits and accumulation by capital holders come at the expense of other groups in society—intensifying economic inequalities and social tensions […]. Recession and depression are possible within capitalism; degrowth is probably not.*
> *(Kallis et al., 2018, p. 4.10).*

This quote points to a key notion for degrowth advocates – degrowth is categorically different from recession or depression. It is the idea that living well under conditions independent from growth is not only possible, but necessary.

Excursus 1: Critical [T]heory

Critical Theory emerged from the Marxist tradition and has since been used in the context of a critique of (neoliberal[39]) capitalism. It has both a narrow and a broad meaning in the history of social sciences. In the *narrow* sense (when capitalized as Critical Theory), it refers to the academic elaboration by the neo-Marxist Frankfurt School in Germany in the 1930s, with authors like Theodor Adorno, Herbert Marcuse and Max Horkheimer, and Jürgen Habermas (as a modern 'Frankfurt theorist').

Ideology critique (see below in section 2.3.1) is a central element of Critical Theory (see Gertenbach & Rosa, 2009, p. 193; Brookfield, 2000, p. 128). Ideological and cultural forces, and their manifestations, are considered barriers to emancipation (Horkheimer 1982, p. 161). Horkheimer writes of 'enslavement', in the sense that people's "consciousness and behavior […] had been an enforced conformity, a product of a situation that had enslaved them" (ibid., p. 161).

A distinction that will be fundamental to this thesis is suggested by Horkheimer: He distinguishes traditional and critical theory, in that traditional theory, in its ostensible impartiality, can only acknowledge and describe facts. A theory becomes critical, however, when it ventures beyond the merely explanatory, and seeks intervention in or emancipation from that which it describes (see ibid., p. 161; pp. 230; p. 246).[40]

A critical theory in the *broader* sense is used to highlight similar theoretical elements, and functions as an umbrella term for a theory based on a certain critique. Many theories

[39] "Neoliberal capitalism, which dominated the world economy from the early 1980s […], involved the deregulation of financial markets; speculations; privatization; and globalization. It fostered flexible production of niche products and services using information technology; the outsourcing of production to low-wage economies; the intensification of consumer demand through the ready availability of credit; a much enhanced role for the financial sector; and the partial dismantling of welfare states." (Huckle, 2012a, p. 39)

[40] "It's goal is man's emancipation from slavery" (Horkheimer, 1982, p. 246).

such as feminist theory, queer theory and post-colonial studies etc. were developed with the aim of not only explaining but also transforming the circumstances that 'enslave' people (Denzin & Lincoln, 2005, p. 24).

Therefore, in both the narrow and the broad sense, critical theory aims to illuminate certain blind spots of social life and their underlying assumptions with the ultimate goal of positive social transformation. In chapter 4, which outlines this thesis' research methods, critical theory is further defined from a paradigmatic empirical perspective.

2.3.1 Growth as 1) paradigm, 2) ideology & 3) hegemony

At least three dominant and recurring elements are observable in growth-critical literature. It is crucial to understand their role if degrowth is to be used as an analytic perspective, as in this study. These elements are partly connected to the abovementioned critique of capitalism but are important for the critique of growth overall. They are: 'paradigm', 'ideology' and 'hegemony' (for a related but different observation, see Haapanen & Tapio [2016])[41]. These elements in growth-critical literature have an important meaning for the critical educational perspective (see chapter 3) and for the methodological positioning of the empirical part of this study (see chapter 4).

Economic growth as paradigm

Notions of 'paradigms' often build on Thomas Kuhn's study on 'paradigm shifts' formulated in *The Structure of Scientific Revolutions* (1996). According to Kuhn, paradigms are "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" (Kuhn, 1970, p. viii).

Although some degrowth authors, in a less orthodox usage, also consider degrowth itself to be an 'emerging paradigm' (e.g. Martinez-Alier et al., 2010, p. 1741; Sorman & Giampietro, 2013, p. 80; Weiss & Cattaneo, 2017, p. 220), the word 'paradigm', in the context of degrowth, usually refers to the dominant economic mode (e.g. Welzer, 2011, p. 12; Schmelzer, 2016, p. 168).

This understanding was recently furthered by Schmelzer (2016), who built on Kuhn's definition, using the term 'growth paradigm' to "describe a specific ensemble of societal, political, and academic discourses, theories, and statistical standards that jointly assert and justify the view that GDP growth as conventionally defined is desirable, imperative, and essentially limitless" (Schmelzer, 2015b, p. 264).

[41] A recent qualitative content analysis "of the 21st century growth critique" by Haapanen & Tapio (2016) resulted in a distinction of growth in the discourse of growth as phenomenon, institution and ideology. Their analysis was based on three central growth critical books: Victor's *Managing without growth: Slower by design, not disaster* (2008), Latouche's *Farewell to growth* (2009) and Jackson's *Prosperity without growth: Economics for a finite planet* (2009)]. (1) Growth as phenomenon deals with forms and impacts or consequences of growth (Haapanen & Tapio, 2016, p. 3494). (2) Growth as institution: deals with growth omnipresence in the institutions of modern societies and institutions that either support or depend on growth, and used in a wide sense, as socially embedded rules and norms that guide individual as well as group actions (ibid., p. 3495). (3) Growth as ideology deals with a communities' or groups' collectively shared belief system, which is based on particularly stable shared knowledge (ibid., p. 3499).

The degrowth movement operates on "[t]he paradigmatic proposition [...] that human progress without economic growth is possible" (Schneider et al., 2010, p. 512). The degrowth movement aims at socio-ecological transformations that would most likely break with the dominant modes of production (Buch-Hansen 2018, p. 162). Specific suggestions and examples of transformative pathways that could potentially lead to a paradigm shift (Meadows 1999; Abson et al., 2017) in the context of strong sustainability and degrowth are suggested in section 2.4.

Economic growth as ideology, the social imaginary and its psychosocial effects

Economic growth is considered to be axiomatic, determining our way of thinking (see also Raworth, 2017a, p. 98). In a review of the growth-critical discourse, Haapanen and Tapio come to the conclusion that growth is manifested in the form of an ideology in order that the members of growth societies consider economic growth to be self-evident and natural (Haapanen & Tapio, 2016, p. 3499). When considering economic growth as an ideology, degrowth authors emphasize how the idea of perpetual economic growth leads to the dominance of ideas such as profit maximization and short-term thinking (see ibid.).

There is an astonishing plurality in existing definitions of the word 'ideology' (see Eagleton, 1994, p. 15). However, it is generally acknowledged that ideologies are "sets of values, beliefs, myths, explanations, and justifications that appear self-evidently true and morally desirable. […]. Ideologies are manifest in language, social habits, and cultural forms. They legitimize certain political structures and educational practices so that these come to be accepted as representing the normal order of things" (Brookfield, 2000, p. 129).

Ideology is built in culture and forms part of the self-conception of societies and its modes of production which is – according to Marx - manifested in the dialectical relationship between base and superstructure (see Singer, 2000, pp. 47)[42]. Simply put, ideology is generated by economic processes and is imprinted on the social structure and culture, often misleading and encouraging people to act against their own interests. Rather, ideology leads them to act in favor of the interests of the survival of the social system (see Gertenbach & Rosa, 2009, p. 193).

Gertenbach & Rosa (2009) refer also to Louis Althusser's notion of ideology, in which "ideology is a 'representation' of the imaginary relationship of individuals to their real conditions of existence" (Althusser, 2008, p. 100). Moreover, in Althusser's understanding "[i]deology interpellates individuals as

[42] The dialectic relationship between base and superstructure (see Singer, 2000, pp. 47) is central to Marx' (and Engels') considerations. The 'base' refers to means and relations of production (e.g, people, relationships, materials resources). The 'superstructure' refers to social aspects outside of production (e.g. culture, arts, politics, education). The two dimensions interact with each other: "The mode of production of material life conditions the general character of the social, political and spiritual processes of life. It is not the consciousness of men that determines their existence, but, on the contrary, their social existence determines their consciousness" (Marx 1895, pp. 389; cited in Singer, 2000, p. 47).

subjects" (ibid., p. 103). Becoming a subject therefore results from of a 're-cruitment' of subjects along their role assignment in a society (ibid., p. 105).

Another explanation of how psychological structures are "recruited" (Althusser, 2008, p. 105) for the ideology of growth is given by German sociologist Hartmut Rosa, who has recently had an impact on the German-speaking parts of the degrowth debate (and also on education) with two prominent sociological theories. The first of these is detailed in *Alienation and Acceleration – towards a critical theory of late-modern temporality* (Rosa, 2010; see also 2013a; 2013b). Here, Rosa elaborates on the temporal structure of societies from the perspective of critical theory. He suggests that 'social acceleration' (unlike the 'great acceleration' as described by e.g. Steffen et al., 2015b) has three dimensions: (1) *technological acceleration* driven by the economic motor in communication, production, infrastructure, etc.; (2) the *acceleration of social change*, driven by the 'structural motor' in relationships, institutions, culture, etc.; and (3) the *acceleration of the 'pace of life'*, driven by the 'cultural motor' in social ideals of fulfillment or a 'good life' in contrast to the technological promises of an increase of free time (Rosa, 2003, p. 12; Rosa, 2013b, pp. 71).

These three dimensions interact in a 'self-reinforcing feedback loop', which is based on a 'fateful' connection between growth and pace and fueled by social 'engines' of acceleration, such as competition (see Rosa, 2013a, pp. 34). From both the subjective and objective perspectives, one of the social symptoms of acceleration is having less time for each single activity. This is referred to as a "shrinking of the present" (ibid., p. 23, translated by the author) which results in the alienation that characterizes modern life, which was briefly introduced in the previous section.

The interplay of alienation and acceleration, Rosa suggests, is a suitable contemporary perspective for diagnosing the most acute symptoms afflicting and shaping human psychology and behavior in "late-modern temporality" (Rosa, 2010).

In *Resonance - A Sociology of the Relation to the World* (Rosa, 2016, my translation), Rosa outlines what he calls 'resonance', his other theory relevant for this thesis, which acts in contrast to alienation. 'Resonance' is described as the connection to the world that informs a '(good) life', which Rosa describes as characterized by stable relationships to an issue, such as playing piano or political engagement (ibid., p. 296). 'Resonance' is created through sets of circumstances that allow people to fully and immediately experience the relationship between the individual and the world surrounding them (Rosa, 2016, pp. 402; Rosa & Endres, 2016, pp. 46).

According to Rosa, resonance has a dialectic relationship to alienation (Rosa, 2016, p. 315) and offers a potential remedy for (the symptoms of) acceleration. In the context of degrowth, developing 'axes' of resonance beyond

the logic of growth could be a potential pathway to socio-ecological transformations.

Building on von Humboldt and the classic educational topos of 'self and world', which will be explored in detail in chapter 3, Rosa identifies education as a crucial sphere for the creation of 'axes of resonance' (Rosa, 2016, pp. 402; Rosa & Endres, 2016, pp. 46). A 'pedagogy of resonance' is therefore important for countering alienation (Rosa 2016, p. 412). For Rosa, education should focus on fostering and supporting 'resonance capacity' (ibid., p. 418, German: *'Resonanzfähigkeit'*) because young people tend to genuinely have an interest in most world-related issues before they become devitalized by the 'zone of alienation' in many educational processes. Rosa argues that, for educational processes, resonance does not mean 'echo' but rather 'resistance', which calls for unconventional educational solutions (Rosa 2016, pp. 416).

Rosa's work is mostly read within the German-speaking degrowth context. A better-known concept in the international degrowth debate on ideologies is Greek-French post-Marxist philosopher Cornelius Castoriadis' idea of the social imaginary (1987).

Simply put, the 'social imaginary' (another similar term in the German debate is 'mental infrastructures'[43]) is a socially embedded set of rules and norms which functions as an 'institution' of significations. "The social world is, in every instance, constituted and articulated as a function of such a system of significations, and these significations exist, once they have been constituted, in the mode of what we called the actual imaginary (or the imagined)" (Castoriadis, 1987, p. 146).

For Castoriadis, transcending the dominant ideology requires a shift in 'social imaginary significations' (ibid.). In this sense, imaginary significations can encompass fundamental self-definitions of societies including goals and aims of future social direction (and even possibly socio-ecological transformations) of societies (see ibid., pp. 146).

Castoriadis' close ties to critical theory (see Memos, 2014, p. 4) are emphasized in his work. In the degrowth context especially, his book *The Imaginary Institution of Society* (1987) is a key point of reference. In his book, Castoriadis points out how our self-portrait of extreme rationality, which is historically rooted, is shaping the imaginary of the modern world, which is driven and dominated by our economic reality:

> *"The economy in the broadest sense (from production to consumption) passes for the most perfect expression of the rationality of capitalism and of modern societies. But it is the*

[43] In the German speaking context, the term 'mental infrastructures' introduced by Harald Welzer (2011) has gained popularity in recent years and refers to a phenomenon similar to Castoriadis' social imaginary (1987). Welzer describes that our life worlds are not only determined by material and institutional infrastructures, but also by mental ones. Economic growth has become a mental infrastructure in the form that the external world is echoed in the neuronal internal structures (Welzer, 2011, p. 11).

economy that exhibits most strikingly the domination of the imaginary at every level – precisely because it claims to be entirely and exhaustively rational."
(ibid., p. 156)[44]

This domination is also manifested in and created by social institutions with their symbolic networks and systems such as laws, power structures and religions (see ibid., p. 117), and therefore, these institutions (and *educational* institutions in particular) are key to reproducing the social imaginary.

Castoriadis' 'social imaginary significations' (ibid., p. 146) relate to both the ideology of economic growth (Haapanen & Tapio, 2016, p. 3499), with its set of rules and norms, and to its hegemony, because the social imaginary is maintained by symbolic networks and power structures in social institutions (see next section).

Excursus 2: Degrowth and its relation to critical social theory

The growth-critical discourse in general, but especially in its anti-capitalist form – degrowth – maintains theoretical relations to critical theory (see excursus 1). It also meets the criteria defined by Horkheimer (1982, p. 188, see section 2.4). It is oriented towards *criticizing* injustice and voicing social grievances through its identification and explanation of the dynamics of economic growth and neoliberal capitalism as major causes of unsustainability. It aims at *transforming* society as a whole and at the emancipation of people's consciousness and behavior (see ibid., p. 246), as well as the social imaginary.

Degrowth authors often link their work directly or indirectly to critical social theories. One example is Latouche's (2015) adoption of Castoriadis' (1987) notion of the 'social imaginary' (it also has similarities to Habermas' [1987, pp. 332] notion of 'internal colonization'[45]). Latouche considers the social imaginary as well as the minds of individuals to be 'colonized' by the paradigm of growth (Latouche, 2015, p. 119). He argues that in order to combat society's addiction to growth and transform the economic system, we must change also our imaginary significations of growth. This means that the 'decolonization of the imaginary' becomes a crucial task (ibid.)[46].

Although a systematic theoretical analysis that summarizes degrowth as an (emerging) critical social theory is still lacking, the roots of many degrowth contributions in critical theory are clearly visible. The combination of critique and transformative aspirations (Horkheimer 1982, p. 188) are characteristic of the degrowth discourse. This thesis builds on this identification of degrowth as an emerging critical social theory and continues to reflect the links in the methodological section of this study.

[44] See also Castoriadis' *Capitalism as Imaginary Institution* (Castoriadis, 2014, my translation).
[45] In Habermas' theory of the colonization of our living realities, the private sphere is undermined by the economic system and the public sphere is undermined by the administrative system and its institutions. This theory is accompanied by the critique of self-destructive forces in our cultures, which destroy the social and personal foundations in societies (see Gertenbach & Rosa, 2009, p. 241).
[46] "[I]f growth and development are beliefs, and therefore imaginary significations like 'progress' and all founding categories of the economy, then to get out, to abolish and go beyond them […], means that the imaginary must be changed" (Latouche, 2015, p. 117).

Economic growth as hegemony, the domination of people

Italian Marxist Antonio Gramsci (1929-1935/qtd. in Hoare & Smith 1992) used the term 'hegemony' to refer to the fact that the dominant power in the 20th century was not always expressed in physical force but also through psychological attempts to win people's consent to domination (see Hoare & Smith 1992, p. xiv) through cultural institutions such as media and schools. His use of the term suggests the "permeation throughout society of an entire system of values, attitudes, beliefs, and morality that has the effect of supporting the status quo in power relations" (Huckle, 2017a, p. 68).

Hegemony connects to ideology in the way that it qualifies ideological and cultural (invisible, underlying and implicit) determinants in order to maintain and concentrate power (see Mayo, 2015, p. 116). Power and domination are ultimately engraved in the consciousness of the people over whom they are wielded (see Kincheloe & McLaren, 2005, p. 309).

The predominance of the dogma of economic growth in most societies, especially OECD countries, may be described as a hegemony (Schmelzer, 2016, p. 10). It operates on many levels, but consumer culture in particular is an active agent in the hegemony of growth (see Haapanen & Tapio, 2016, p. 3497). Consumption and demand (Paech, 2017, p. 478) are both drivers of economic growth and dependent upon growth (see Seidl & Zahrnt, 2012, p. 8), not only on the level of the individual but also on the societal level. This trap of codependency is what Jackson calls "the 'iron cage' of consumerism" (Jackson, 2009, p. 87).

Consumption here refers not only to what is known as 'status consumption', in which individuals consume in order to express personality and construct identity (see Haapanen & Tapio, 2016, p. 3497) but also to a process of socialization. People are socialized to be consumers from an early age and are constantly encouraged to consume, especially through advertising (see Haapanen & Tapio, 2016, p. 3497; referring to Jackson, 2009, p. 191; Latouche, 2009, pp. 16; Victor, 2008, p. 35; p. 220). One of the challenges for education in the context of growth's hegemony is to deconstruct and tackle the ideologies which are dominated by the paradigm of growth (see following section) and permeated by power and hierarchy, and which prevent individuals and societies from breaking free from "the 'iron cage' of consumerism" (Jackson, 2009, p. 87).

Growth critical authors Ulrich Brand and Markus Wissen (2017a; 2017b) contextualize the relationship of consumerism with their conception of the 'imperial mode of living'. By definition, "[t]he concept of the [imperial mode of living] highlights the fact that capitalism both implies uneven development in time and space as well as a constant and accelerating universalization of a Western production model" (Brand & Wissen, 2017a, p. 152). In their view, people's everyday practices, individual and societal orientations, and also identities, rely on three aspects: "(1) the unlimited appropriation of resources, (2) a

disproportionate claim to global and local ecosystems and sinks and (3) cheap labor from elsewhere" (ibid.).

They emphasize that the imperial mode of living is more than a 'lifestyle' because it is strongly interconnected with "dominant patterns of production, distribution and consumption" (ibid., p. 153). They suggest that this 'attractive' but very unsustainable mode of living has been unevenly globalized over the past few centuries. It has its origins in the capitalist and colonial history of the Global North and is interwoven with the development of modern capitalism (see ibid.:159). This concept of the 'imperial mode of living' is helpful for explaining the interrelation between the ideology and hegemony of growth. Our dominant modes of living, which are unavoidably based on such consumption patterns, are both subject to and agents of unsustainability.

In short, the three recurring elements that are objects of criticism in the degrowth debate – growth as paradigm, ideology and hegemony – can be distinguished from each other as follows: Economic growth as *paradigm* is easiest to distinguish from the other two elements, ideology and hegemony, because it most of all refers to the operating modes of growth and the societal and political measures supporting the notion that endless growth is natural and imperative to the functioning of the economic and social system. Consequently, as an *ideology*, economic growth influences and determines our way of thinking and is imprinted on the social imaginary, the culture and the values of society; as a *hegemony*, economic growth dominates people by maintaining societies' hierarchical power structures. It is connected to growth as ideology, because this domination does not require physical power, but rather mental or *ideological* power. Growth as ideology and hegemony are therefore closely interconnected, as they both influence people's consciousness. While ideology relates more to the psychological mechanisms underpinning economic growth, hegemony functions to steer people's habits, such as consumption patterns, which they themselves can only change to a very limited extent.

2.3.2 Synthesis for education: Degrowth in the narrower sense and critique of capitalism

Based on the interconnected foundations to growth criticism as indicated in the section 2.1, scholars of degrowth in the narrower sense argue that growth criticism cannot be separated from a critique of capitalism (Muraca 2014; Kothari et al., 2014; Brand & Wissen, 2017a). Building on this argument, there are two overarching features that have educational implications and that are important for the rest of this study.

The first of these is that this study builds on the implicit and explicit ties of degrowth to critical social theories. Whether or not degrowth itself is an *emerging* critical social theory is not a key concern of this thesis. Some argue

that degrowth might be described as rather an analytic perspective instead of a 'theory'. So far, there is neither a consensus or even a serious debate on whether and how degrowth indeed fulfils the 'criteria' of a critical social theory. Nevertheless, the direct or indirect links of various degrowth contributions to critical theory indicate that there is at least a close relation, particular due to the Marxist tradition (e.g. Castoriadis 1987; Gorz, 1980; Harvey, 2014). However, degrowth is definitely both critical *and* transformative (see following section 2.4), characteristics which distinguish a critical theory from a traditional theory (see Horkheimer, 1982) and that could be foundational to developing educational measures.

The second feature is that growth functions in at least three categories simultaneously: as a paradigm, ideology and as a hegemony. The three categories illustrate how growth dominates not only economic activity but also our social imaginary. They also explain why the idea of growth is so persistent in our societies and why – and how – it is constantly reproduced. But most importantly, the categories are interconnected and can be used in education to explain how growth functions. Patterns of growth dominate all spheres of life and social organization, and they reproduce their own ideology and hegemony. Questions for education that arise include: How is the educational system involved in the reproduction of the paradigm, ideology and hegemony of growth? If our social imaginary and also our patterns of behavior are dominated by growth, can education contribute to work against this?

Education has the potential to counteract the way the ideology of growth determines our culture and colonizes our social imaginary (see Castoriadis, 1987; Latouche, 2015), causing 'social acceleration' (Rosa, 2003; 2013b) and alienation (Rosa, 2016). The ideology of growth and the hegemony of growth have a mutually constitutive relation to one another. Processes of consumption effect our socialization and strengthen our ideologies while simultaneously acting as drivers of growth. Our social imaginaries are shaped by mechanisms that are dictated by the growth paradigm and the dynamics of capitalism. At the same time, they too reproduce the hegemonic 'imperial mode of living' that fuels continuous unsustainable acceleration (see Brand & Wissen, 2017).

It will be a central challenge for education to reflect on this social imaginary and to understand how it is colonized by growth. In meeting this challenge, educators might perhaps make use of the learners' individual experiences by clarifying priorities and making self-experiments on the level of daily consumption. On a more structural level, the institutions that are bound to growth might also be critically examined using the personal experiences of the learners in such institutions. Educators might bring into the process questions such as: What are the macro-economic processes behind the paradigm? What does it mean for educational institutions to be bound to a certain paradigm? Are there alternative imaginaries for social organization beyond growth?

2.4 Socio-ecological transformations 'by design'

Building on the critical trichotomy of the last section, from a societal perspective, the task remains to achieve a paradigm shift. But what would a 'degrowth paradigm shift' (Buch-Hansen, 2018) look like? What are the concrete proposals for socio-ecological transformations?

Degrowth is often framed as a "project for a radical [socio-ecological] transformation" (Muraca, 2013, p. 147; see also Kallis & March, 2015, p. 360). However, some authors argue that social transformation among degrowth lines will likely not be the outcome of voluntary or collective choice (Buch-Hansen, 2018, p. 161; see also Sorman & Giampetro, 2013, p. 91). Pragmatically speaking, transformation is something that will happen with or without political or social commitment to it. "Eventually and inevitably, humanity will move out of overshoot. But I hope that we can do this by design, not by disaster"[47] (Wackernagel, 2014, p. 6; see also Sommer & Welzer, 2014, p. 27).

While the socio-ecological transformations of the past were the result of gradual evolutionary change in accordance with increased energy and material use, the next "great transformation" (Polanyi, 1944) "is by no means an automatism. It very much depends on 'organizing the unplannable' if it is to succeed within the available tight timeframe." (WBGU, 2011, p. 1). However Kallis, a proponent of degrowth by design, argues that societies do have the option and the capacity to reduce growth and to…

> *…"deliberately transform […] modes of production and consumption. […] [D]egrowth is not only necessary because we are running out of petrol and atmosphere, but because a downscaled world can be, under certain conditions, also more equitable, democratic and livable."*
> *(Kallis, 2013, p. 97)*

2.4.1 Socio-ecological transformations

As is indicated in the quotation above, there are different models of 'designed' or 'organized' transformation processes. While one type of research approach focuses more on governance processes like 'transition management' (e.g. Kemp et al., 2007; Rotmans & Loorbach 2009; Loorbach, 2010; WBGU, 2011), others are oriented more along the lines of grassroots initiatives and social movements (see Weiss & Cattaneo, 2017, p. 225)[48]. In regards to the former, many research efforts are located in inter-and transdisciplinary sustainability research (see Brandt et al., 2013, p. 1).

[47] Based on Peter Victor's book *Managing without growth: Slower by Design, not Disaster* (2008), this well-known quote by Mathis Wackernagel, President of the Global Footprint Network[©], was cited many times to indicate that the choice is between these two pathways.

[48] Weiss and Cattaneo (2017) conducted a review of degrowth and transitioning. They summarize that degrowth transitions will be diverse and largely based on grassroots proposals and bottom-up initiatives, but they also rely on certain aspects for 'governing' or 'managing' degrowth transitions (Weiss & Cattaneo 2017, p. 225).

Their models of transformations are therefore labeled "socio-ecological transition studies" (Martinez-Alier et al., 2011, p. 31). They often focus on how to promote and/or govern a fundamental transition towards sustainability in societies that face unsustainability due to structural causes (see Markard et al., 2012, p. 955).

'Socio-ecological transition studies' also analyze processes for shifts in socio-metabolic transitions towards sustainability (Haberl et al., 2011). According to Haberl et al., the term 'social metabolism' encompasses the entire flow of materials and energy that is required to sustain all human economic activity (ibid., p. 3). The past models of 'hunter-gatherer', 'agrarian' and 'industrial' societies all display very different metabolic profiles. With each societal shift, an incredible increase occurs in terms of the rates of total energy use, use of materials and population density (see ibid., p. 2). In order for a *third* 'Great Transformation' to take place, the authors emphasize the need for a significant decrease in social metabolism (the amount of energy and matter used) and argue that land-use must be re-organized into a "net energy producing system" (ibid., p. 11).

Such studies and analyses provide useful insights on how drastically socio-ecological transformations need to be shaped. Transformation in social metabolism must coincide with a transformation of the political structures, institutions and human behavior patterns (such as lifestyles, consumption patterns, value change and participation) that are the central drivers of change (see e.g. Fischer-Kowalski & Rotmans, 2009, p. 8; Fischer et al., 2012, p. 2; WBGU, 2011, p. 16).

Recently, projects in sustainability science have employed Donella Meadows' concept of 'leverage Points' for better understanding processes of transformation (e.g. Abson et al., 2017; Luederitz et al., 2017). According to Meadows, leverage points are those loci where a small change in one aspect can lead to much greater changes in a whole complex system (Meadows, 1999, p. 1). Researchers employing this concept see the strength in Meadows' framework of twelve leverage points[49] in its ability to explain differences in the depth of change processes (see Abson et al., 2017), which range from shallow to deep (see also Luederitz et al., 2017, pp. 394). According to Abson et al., "interventions [that] are relatively easy to implement yet bring about little change to the overall functioning of the system" Abson et al. 2017, p. 31) are considered *shallow*. On the other hand, "'deep' leverage points […] might be more difficult to alter but potentially result in transformational change" (ibid.). 'Very shallow' leverage points are typically targeted by policy-makers like e.g. subsidies, taxes etc. (see Meadows 1999, p. 3). On the other extreme are 'very

[49] The full spectrum of leverage points or "Places to Intervene in a System (in increasing order of effectiveness)" (Meadows, 1999, p. 2), encompasses: "9. Constants, parameters, numbers (subsidies, taxes, standards); 8. Regulating negative feedback loops; 7. Driving positive feedback loops; 6. Material flows and nodes of material intersection; 5. Information flows; 4. The rules of the system (incentives, punishments, constraints); 3. The distribution of power over the rules of the system; 2. The goals of the system; 1. The mindset or paradigm out of which the system - its goals, power structure, rules, its culture - arises" (ibid.). The counter-intuitive numbering suggests that lower numbers are the deep seated configurations of a system.

deep' leverage points – those which precipitate a shift in the values, goals, and worldviews that define the orientation of a system (see Abson et al. 2017, p. 32).

According to Meadows, a shift in mindsets – a very deep leverage point - potentially even has the power to transcend paradigms[50] (Meadows 1999, p. 3). Abson et al. (2017) see potential in the "interactions among leverage points" (Abson et al., 2017, p. 36), suggesting that the deeper leverage points such as paradigms, mindsets and values are vital in shaping the shallower aspects. On the other hand, an adjustment in framing conditions (shallower leverage points) may also challenge mindsets - therefore possibly and ultimately shifting the paradigm of a system (see ibid.).

2.4.2 Growth critical perspectives on socio-ecological transformations

Large sections of the degrowth community acknowledge that a 'degrowth paradigm shift' cannot take place within the dominant economic paradigm. Although the strength of degrowth currently lies in the levelling of 'powerful critique' at the dominant neoliberal paradigm rather than constructing or consolidating the actual degrowth paradigm shift on the political level (Buch-Hansen 2018, pp. 161)[51], many authors do open up perspectives on potential pathways for transformation towards a degrowth society. Including degrowth reasoning in debates about sustainable futures has the advantage of re-*politicizing* the debate on socio-ecological transformations (Demaria et al., 2013, p. 192).

Building on Latouche's notion that the first step towards a degrowth society is the decolonization of the social imaginary, political philosopher Barbara Muraca suggests that any transformation in the context of degrowth must acknowledge the social imaginary as a central dimension. Muraca outlines, alongside the social imaginary, two other dimensions that are important for the change of society as a whole. Together, they are:

1. The structural and institutional dimension
2. The dimension of individual and collective practices and
3. The social imaginary that gives collectively approved meaning to the first two dimensions (Muraca, 2015, p. 205, my translation).

[50] In a very instrumental perspective, Meadows (1999) suggests that while building on Kuhn's conception of paradigms, the dominant paradigm can be changed as follows: "In a nutshell, you keep pointing at the anomalies and failures in the old paradigm, you keep speaking louder and with assurance from the new one, you insert people with the new paradigm in places of public visibility and power. You don't waste time with reactionaries; rather you work with active change agents and with the vast middle ground of people who are open-minded" (Meadows, 1999, p. 18).

[51] Buch-Hansen (2018) argues that from the perspective of critical political economy, a transformation encompasses four requisites for socio-economic paradigm shifts: "deep crisis, an alternative political project, a comprehensive coalition of social forces promoting the project in political struggles, and broad-based consent" (Buch-Hansen, 2018, p. 157). In his research he aspires to identify in which way the prerequisites for a 'degrowth paradigm shift' are already met or not. The first precondition of crisis is easily met (ibid., p. 159). The second precondition of an alternative project is also met because degrowth can be considered as an "unconventional political project that is still under development" (ibid., p. 160). Buch-Hansen assesses the third precondition, "a comprehensive coalition of social forces promoting the project in political struggles" as *not* easily met. Degrowth does not have a 'shortage in creativity and enthusiasm', but it "does not possess *instruments that enable [advocates] to force political decision-makers to listen to […]their views" (ibid., p. 161). In terms of* the fourth precondition, 'consent', degrowth does not meet it yet (ibid., p. 161).

Muraca suggests that although all three dimensions are crucial for any kind of social transformation, the social imaginary is foundational to the collective practices as well as the institutions of a society and is of particular importance for degrowth (ibid.). She emphasizes that in this understanding, the social imaginary is less about individual values, orientations and imaginaries than it is about the "foundational self-conception of a society that pulls th[at] society together" (ibid.).

As long as economic growth is not questioned and systemic changes do not take place, the underlying social imaginary of capitalist societies is stable. In a transformative perspective, she argues that the increasing societal crises can potentially support shifting the colonized social imaginary. In a second step, the decolonized social imaginary could transform also the systemic and institutional conditions that manifest and reproduce the growth paradigm. For Muraca, the second dimension operates as a mediating instance between the transformation of the social imaginary and the structural dimension. It opens up spaces for practically experiencing the social imaginary in the form of socio-economic alternatives (ibid.).

The following sub-chapters describe such transformative, growth-critical alternatives. According to Seidl and Zahrnt, some of these alternatives are 'purely economic' (e.g. Georgescu-Roegen, 1971; Daly, 1991) while others impact on all public spheres (Seidl & Zahrnt, 2012, p. 11). Each of these sections will also end with a brief assessment for the role of the respective model in educational contexts. It is hoped that this will enable better connections between the theoretical and educational chapters of this thesis.

Steady-state economics

One such 'purely economic' contribution is Herman Daly's well-known[52] work on steady-state economics. Steady-state is an alternative to what Daly calls 'growthmania' (Daly, 1991, p. 180). As "a physical concept" (Daly, 1991, p. 17) a steady-state economy cannot grow forever. By definition, it is

> *"an economy with constant stocks of people and artifacts, maintained at some desired, sufficient levels by low rates of maintenance 'throughput', […] from the first state of production (depletion of low-entropy materials from the environment) to the last stage of consumption (pollution of the environment with high-entropy wastes and exotic materials)."*
> *(Daly, 1991, p. 17)*

While standard economics demands an ever-growing cycle of production and consumption without consideration of the role of the supporting ecosystem, steady-state economics considers cycles of production and consumption to be in an equilibrium with the surrounding ecosystem (see Daly, 1991, p. 181).

[52] Daly's considerations are based on the considerations of entropy in economics and are a central point of reference for the growth-critical discourse in the United States (Seidl & Zahrnt, 2016, p. 9).

However, and writing well before Daly, Georgescu-Roegen argues that the entropy problem remains in a steady-state system because of the continuous degradation of matter[53]: "If open, the state can only be quasi-steady" (Georgescu-Roegen, 1977, p. 270).

For education, steady-state economics can provide another model for the economic process. In combination with Georgescu-Roegen's images of the 'mechanical pendulum' in standard economics and the 'well-insulated hourglass' in ecological economics, steady-state economics can provide another, cyclical, understanding of material flows. Educators could work with such ideas to make basic economic knowledge and assumptions the subject of the discussion.

Post-growth-society

Whereas steady-state economics emerged during the first phase of growth criticism, the following perspectives are contemporary and push beyond the 'purely economic'.

Irmi Seidl and Angelika Zahrnt raise the question of why politics still clings to the idea of generating economic growth in spite of clear evidence of its negative effects (Seidl & Zahrnt, 2010, p. 34). They explain these effects with reference to those sub-systems that have historically become ever more dependent on economic growth, such as the social security sector, taxes and the financial system in general (ibid., p. 23). Furthermore, in identifying this issue of our societies' reliance on growth-dependent operating modes of the public sector, they explore also how those societies have collectively lost any imagination of how public sectors might otherwise be designed, without the diesel-engine of economic growth.

In this spirit, Seidl and Zahrnt, introduce their concept of a post-growth society (in German '*Postwachstumsgesellschaft*') (ibid., p. 34) one which has become well-known in continental Europe, especially in the German-speaking world. The post-growth society aims at the transformation of all of society, not only the economy. This includes abandoning the idea of continuous economic growth, developing imaginaries beyond growth, and re-designing most societal and economic sub-systems (ibid., p. 10; Seidl & Zahrnt, 2012, pp. 2; 2016, p. 9). A post-growth society is characterized as follows: (1) There are no policies in favor of additional economic growth; (2) social sectors, institutions and structures that are both growth dependent and growth drivers themselves need to be modified in a way that they are independent from growth; (3) and growth in energy and resource consumption needs to be halted (Seidl & Zahrnt, 2010, p. 34).

[53] "[N]o economic system can survive without a continuous inflow of energy and matter; in particular it cannot be a closed steady state. Even if all [waste] could be recycled,[…], the dissipation of matter would still prevent the capital found from being constant" (Georgescu-Roegen, 1977, p. 269).

For educational contexts, the post-growth society is a comprehensive idea that encompasses most public spheres and sectors. Using this approach, learners could develop a better understanding of the growth-dependencies of social sectors and institutions. Muraca's suggestion of the three dimensions of socio-ecological transformations could be useful in education to address the characteristics of the post-growth society. Particularly the structural and institutional dimension, but also that of the individual and collective practices could help to explain the necessary modification of social sectors. In educational processes, the dimension of the social imaginary would also be tackled if they were applied to help imagine how institutions and structures could be designed differently without economic growth.

Post-growth economics

For economist Niko Paech, degrowth transformations are deeply sufficiency-oriented (Paech, 2012; 2017, p. 483). Paech suggests a post-growth-economy (in German '*Postwachstumsökonomie*') with the overall aim of reducing supply and demand in economic systems, their sub-systems and in individual lifestyles (Paech, 2017, p. 478).

Post-growth economics encompasses (1) *growth criticism*, which includes aspects such as failures of decoupling, unjustified wealth, social inequality; (2) *growth compulsion* between demand side and supply side and (3) *post-growth economy*: sufficiency, self-supply/subsistence (20 weekly working hours releasing time resources to non-market activities), regional economies (as 'in-between' local subsistence and global division of labor), a steady-state industry (material zero-sum games as a production mode) and institutional change (Land, monetary and financial market reforms (ibid., pp. 478).

Paech's (2017) approach to post-growth-economics, explicitly includes the sphere of 'criticism': of both the problems of the current economic mode and also the mechanisms of 'growth compulsion'. Similar to other degrowth contributions, the 'post-growth economics' approach claims that a sustainable mode of economy needs to mediate between the unsustainable dominant patterns of production and a transformative pathway.

Making use of this approach, educational processes could, for instance, clarify the reasons for growth criticism (1, see Paech above), understand the mechanisms of growth compulsion (2) and also imagine potential forms of how a post-growth economy could be designed (3).

Doughnut economics

Another, rather recent contribution to the growth critical debate comes from Kate Raworth in her book, *Doughnut Economics* (2017a). Like Daly, and like

Seidl and Zahrnt, Raworth does not use the term 'degrowth'[54] but nevertheless bases her approach on very similar economic and societal assumptions as the degrowth discourse.

Refining the concept of 'planetary boundaries' (Rockström et al., 2009; Steffen et al., 2015a), the 'doughnut' is defined as "the safe *and just* space for humanity" (Raworth, 2017a, p. 44) where a different mode of *economic* activity could mediate between the "overshoot" beyond the "ecological ceiling" on the one hand, and the "shortfall" below the "social foundation" on the other (ibid., see also Fig. 6) without crossing boundaries in either direction.

In seven steps, Raworth aims to make the notions and mechanisms produced by growth-oriented neo-classical ('20th Century-') economics transparent. Subsequently, she develops an alternative notion of '21st Century economics'. She advocates, for instance, 'changing the goal' from *GDP* to *the doughnut* (ibid., pp. 31); 'seeing the big picture', i.e. shifting from a *self-contained market* to the *embedded economy* (ibid., pp. 61); 'nurturing human nature' from *rational economic man* to *social adaptable humans* (ibid., pp. 94); and finally, to "being agnostic about growth" (ibid., pp. 243) – moving from *growth addicted* to *growth agnostic* (ibid.).

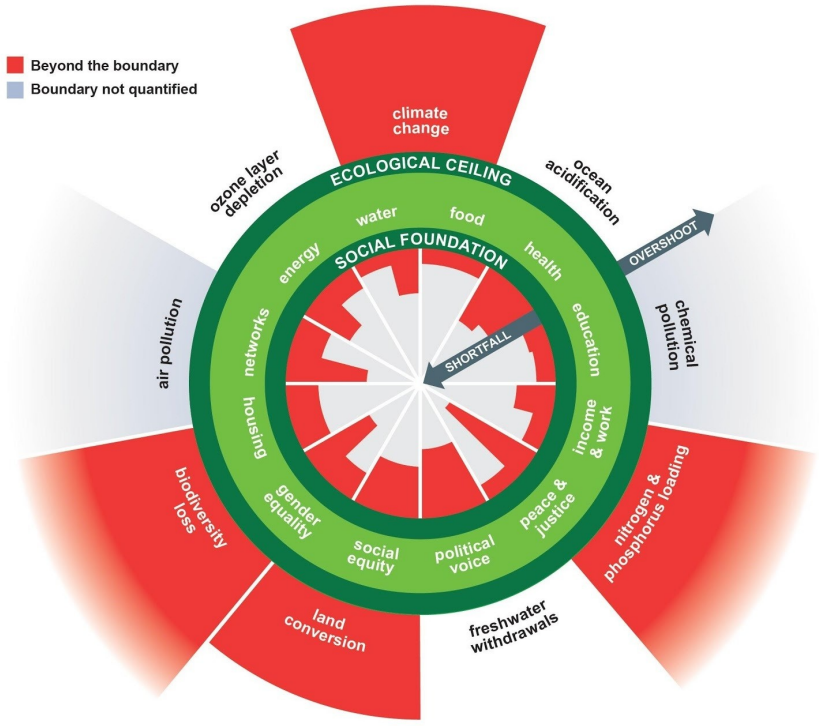

Fig. 6: 'Doughnut Economics' (Figure from Raworth (2017a, p. 44). The "safe *and just* space for humanity" (ibid.) lies between the "social foundation of human well-being" (ibid.) on the inside of the doughnut which is marked by 12 social dimensions that are "derived from the social priorities specified in the United Nations

[54] Blog entry by Kate Raworth (2017b) "Why Degrowth has out-grown its own name: Guest post by Kate Raworth", cited by: https://oxfamblogs.org/fp2p/why-degrowth-has-out-grown-its-own-name-guest-post-by-kate-raworth/, *Date of access: 31.05.2019*. The blog entry has been reprinted (Raworth 2017b) in Giorgio Kallis' "In defense of degrowth" (Kallis, 2017a) together with his response: "You're wrong Kate, degrowth is a compelling word" (Kallis, 2017b).

's 2015 Sustainable Development Goals" (ibid., p. 295) and the "ecological ceiling of planetary pressure" (ibid.) on the outside of the doughnut, marked by the nine planetary boundaries (Steffen et al. 2015a).

Like the images of economic processes provided by Georgescu-Roegen (1977) or Daly (1991), Raworth's visual representation of doughnut economics has a lot of potential for educational programs in its combination of scientific perspectives (building on the planetary boundaries conception) with the social science perspective of the SDGs. The model of the doughnut may thus help learners by encouraging them to reflect on the absence of such an integrated perspective in the predominant social imaginary. Moreover, Raworth's use of concepts such as moving from *rational economic man* to *social adaptable humans* could help clarify for learners how society's foundational self-conception is manifested.

(Re-)productivity & care

Feminist critique takes as its point of departure the idea that productive forces are mainly built on natural *and* human exploitation (especially that of women*). In the tradition of this critique, Biesecker and Hofmeister contributed to the development of the central category of *(re)productivity* (Biesecker & Hofmeister, 2010, p. 1703). According to Biesecker and Hofmeister *(re)productivity* refers to "the idea of the unity of and at the same time the distinction between production and reproduction in the economic process" (ibid.). They suggest that separation between the two spheres is one cause for the present socio-ecological crises (ibid.).

Central to their argument is that 'care' is not currently part of economic activity. 'Care' is however generally acknowledged in the degrowth discourse, and is today a central category in many degrowth authors' reasoning:

> *"In the present economy, care work remains gendered, undervalued, and pushed into the shadow of the formal economy. Degrowth calls for the equal distribution of care work and the re-centering of society around it. A caring economy is labor-intensive precisely because human labor is what gives care its value. It thus has the potential to offset rising unemployment today while fostering a more humane society."*
> *(Kallis, 2015, p. 21)*

According to Biesecker and Hofmeister, if care is not its center, an economy will automatically be "unable to preserve and regenerate the ecological and social foundations on which it rests" (Biesecker & Hofmeister, 2010, p. 1703).

They suggest an integrative framework between the 'production' and '(re)production of natural and anthropogenic forces, with the principle of 'care' at the center. This framework consists of four integrative phases. They are: (1) 'The natural production system' (ibid., p. 1709), (2) 'anthropogenic production' (especially labor), (3) 'anthropogenic consumption' and (4) 'natural reduction' (ibid., pp. 1709). The phases should be seen as a means of socio-

economic mediation, with the main task remaining the conservation of the productivity of nature and labor (ibid., p. 1710).

Such a framework, which puts care and (re-)productivity at its center, extends to all of the dimensions of transformation suggested by Muraca, because a shift in economic priorities, one which focuses on the conservation of nature and labor, has consequences for all other dimensions. In educational processes potential consequences could be creatively considered in individual and collective reflection processes in the context of transformative learning theory which will be introduced in detail in section 3.2.2.

Eight 'Rs' of transformation

Like Paech, for economic anthropologist Serge Latouche, degrowth transformations align with the idea of sufficiency. His utopia of transformation includes eight goals (eight 'Rs') that could "trigger a process of de-growth that will be serene, convivial and sustainable" (Latouche, 2009, p. 33). He argues that these eight Rs are both interdependent and mutually reinforcing. The eight 'Rs' are:

1. *Re-evaluate* in terms of a shift in values from e.g. egotism towards altruism, or from competition towards cooperation (ibid., p. 34).
2. *Reconceptualize* ideas that are now shaped by the dominant, growth-oriented values. Concepts such as wealth and poverty need to be reimagined (ibid., p. 35).
3. *Restructuring* refers to adapting the capitalist means of production in regards to the shifted values and new conceptions (ibid., p. 35)
4. *Redistribution* has to take place between the North and the South and also within countries (ibid., pp. 36).
5. *Relocalize* the economy towards preferred local production and circulation of goods
6. Reducing
7. Reusing
8. Recycling resources as best as possible (ibid., pp. 38).

For Latouche, degrowth could become a 'concrete utopia' if it is understood as a local project with local economic autonomy and local ecological democracy, one that is both self-governed and convivial. Such transitions reach out to reforms of practical economic aspects such as local 'bioregional' currencies and reduced working hours in connection to basic income (ibid. 50).

In educational processes, such sufficiency-oriented approaches like the one of Latouche but also of Paech (2017) could be a starting point for the individual learning processes around lifestyles and consumption patterns while at the same time embedding it in the 'bigger picture' of the necessity to transform institutions and structures as well as a precondition for economic changes.

Building local economic alternatives

„[T]he degrowth movement […] envisions a radical social-ecological transformation that is driven by the democratization of societal relations to nature and characterized by a bottom-up approach of a multitude of diversified and networked social experiments worldwide"
(Muraca & Döring, 2018, p. 355, based on results of Eversberg & Schmelzer, 2018)

An important perspective on transformation that is echoed throughout this study in its educational and empirical approaches is drawn from social experiments that practically implement such local alternatives in sufficiency and organization (see e.g. Latouche, 2009; Paech, 2012). Bottom-up approaches may be mentioned last in the above quotation's list, but they are absolutely central to the debate. They are diverse and numerous on a global scale.

There is no unifying definition of what 'alternatives' actually are in the context of degrowth.[55] Rather, they are the sum of grassroots and bottom-up approaches that explore a variety of ways to live and organize collectively beyond the hegemony of growth. In 'nowtopias' (Carlsson, 2008), such alternatives are all based on ideas of a different economy, and are developed outside of mainstream institutions and structures. Examples are to be found in approaches such as the 'commons' (Hardin, 1968; Hardin, 2009; Bollier & Helfrich, 2014), 'transition towns', co-housing, consumer-cooperatives, social gardening, ecovillages, solidarity economies or local currencies. Such emancipatory alternatives are driven by a diverse group of actors who are, to a certain extent at least, mostly represented by a group on the degrowth spectrum best described as the "alternative practical left" (Eversberg & Schmelzer, 2018, p. 262).

The commons are often considered to be an important transformative force in the context of degrowth. Fundamental for the commons is that they rely on collective action between self-government and self-organization (Ostrom, 2011, p. 22). Common goods are not only environmental resources that can be used and organized collectively, they can also be forms of social organization. According to Elinor Ostrom, the collective use of and responsibility for common goods is a potential alternative to 'the market' and 'the state' (ibid.).

Demaria et al. point out that some actors in these 'nowtopias' would argue that broader social transformations can be triggered by a cumulative change in individual values and behavior which "is manifest in the lifestyles of people who practice voluntary simplicity, living better with less, downshifting and slowing down life's pace" (Demaria et al, 2013, p. 202). Such lifestyles include critical consumption, which is seen as not only a private, but also a political act. If less time is spent on consumption and formal work, then more time can

[55] However, the introduction to a very recent publication on alternatives beyond development by a group of degrowth scholars portrays "transformative processes around the world that are emblematic in that they been able to change their situated social realities in multiple ways, addressing different axe of domination simultaneously, and anticipating forms of social organization that configure alternatives to the commodifying, patriarchal, colonial, and destructive logics of modern capitalism" (Lang & Hoetmer, 2018, p. 4).

be spent on other activities that are more fundamental to well-being such as social relations and political participation (see ibid.). "[I]ndividual and collective practice here and now represents one (if not necessarily the only) point of departure for the required far-reaching transformations." (Eversberg & Schmelzer, 2018, p. 265).

Building on such local alternatives on a small scale could be a very transformative activity for educational programs operating in the dimension of individual and collective practices (see Muraca). Such examples will be further discussed in chapter 7.

2.4.3 Synthesis for education: Growth critical perspectives on socio-ecological transformations

This fourth section takes a step from a critique of the current economy and its socio-ecological effects towards concrete proposals for transformation 'by design'. Such proposals have different foci. Some are located within the broader sustainability debate, while others are explicitly growth-critical. The common thread between them is that they suggest pathways towards sustainability - and a different paradigm - that aim to intervene in the system *before* socio-ecological transformations occur 'by disaster' (Wackernagel, 2014).

The past sections have suggested that the various approaches of socio-ecological transformations can be useful in educational contexts to help learners better understand the ecological and social needs of transformations 'by design'. The following chapters on education will outline, using a strong theoretical basis and in much detail, how such concepts can be applied in education.

'Socio-ecological transition studies' (Martinez-Alier et al., 2011) suggest that the extremely harmful socio-metabolic profile of industrial societies (Haberl et al., 2011), which led to the "great acceleration" (Steffen et al., 2015b), now requires another great transformation. Paradigmatic changes, however, are not easy to achieve. The 'very deep' leverage points, where the mind-sets and the paradigm of a system are located, are especially resistant to political decisions (see Abson et al., 2017).

This implies that the social imaginary and the ideology of growth are especially resilient. However, Muraca (2015) suggests that the social imaginary is crucially important to socio-ecological transformations because it gives collectively approved meaning to the other two dimensions she identifies, the 'structural and institutional dimension' and 'individual and collective practices'.

If the social imaginary is impenetrable to designed political and economic suggestions, it could be an interesting sphere for educational considerations to explore. Nevertheless, it should be kept in mind that Muraca's three dimensions of transformation are closely interwoven in their interactions and that educational processes will also have to take this complexity into account.

2.5 Conclusions to the degrowth debate

This chapter has indicated that degrowth results from a thorough application of evidence from earth sciences, insights from ecological economics and an analysis of the economic and social system to the sustainability debate. It holds that an absolute reduction of resource use is necessary for achieving sustainable societies. But degrowth is much more than only the downscaling of production and consumption within social and planetary limits (Schneider et al., 2010). Degrowth extends also to a shift in social, economic, political and mental spheres. It is closely intertwined with a fundamental critique of capitalism and builds on critical categories such as paradigm, ideology and hegemony, and is closely linked to Critical Theory. Within the SD discourse, it is without doubt one of the most critical and progressive positions.

In summary, this chapter introduces certain central, overarching aspects of degrowth that will be recurrent themes in the remainder of this thesis. These aspects are also important for education. This list is not exhaustive and there will surely be aspects important for other fields of research. However, the five aspects introduced here are those most pertinent for this thesis.

1. The degrowth debate builds on the ideas of both a 'strong' and a 'nested' sustainability.

Degrowth authors reject the idea of 'weak' sustainability and the substitutability of capitals it deems legitimate. Degrowth unequivocally demands that the 'dimensions' of ecology, economy and society cannot be placed on the same rung of the hierarchical ladder, as is the case in the three-sectors model so popular in neoclassical reasoning. Degrowth considers the ecology and society to be higher than the economy in any hierarchy of importance.

2. The degrowth debate is both critical and transformative.

The degrowth community is keenly critical of both the mainstream SD debate and the dominant economic paradigm of growth. However, among the different positions in the SD debate, degrowth is, among few others, one of the most clearly transformative positions. Degrowth not only maintains strong theoretical ties to critical social theories, it also fulfills the Critical Theory criteria to be considered both critical and transformative.

3. The degrowth debate criticizes economic growth on the levels of paradigm, ideology and hegemony.

The imprint of growth can be found in the trichotomy of paradigm, ideology and hegemony. It is manifest in all levels of our growth-dependent societies. The *paradigmatic* assumption that economic growth is natural shapes the operating modes of the economic system, including social, political and scientific

standards. *Ideologically*, growth shapes the psychology and the social imaginary of the people and as a *hegemony*, it functions to maintain its own power and survival, for instance in dominant consumption patterns and growth-dependent lifestyles.

4. The degrowth debate considers that socio-ecological transformations are necessary in the "structural and institutional dimension", the "dimension of individual and collective practices" as well as the "dimension of the social imaginary" (Muraca, 2015, my translation).

Beyond critique, the discourse opens up a multitude of transformative perspectives. There are multifarious conceptions of how a different socio-economic organization might look. They all abandon economic growth as the paradigmatic position and indicate that another economy is both necessary and possible. A paradigm change would have to include socio-ecological transformations on different levels: in the institutional and structural dimension as well as in the dimension of the individual and collective practices, but first and foremost it requires the transformation of the social imaginary (Muraca, 2015).

5. The degrowth debate especially emphasizes the role of the social imaginary. It is colonized by growth and needs to be decolonized.

The 'colonized' social imaginary (Latouche, 2015) plays a crucial role in the reproduction of the economic system and the maintenance of the dominant paradigm and hegemony of growth (Schmelzer, 2016). The social imaginary, however, is especially resilient to change because it is anchored in the ideology of growth and is based on phenomena such as alienation and commodification that are inherent in capitalism (see second section of this chapter). The social imaginary is an aspect that will also play a crucial role in the following educational chapters, especially in the empirical sections in chapter 5-7.

This chapter builds a solid ground for the following educational chapters and the analysis of the empirical results. At the end of each section, some potential links for education are considered. Building on the condensed insights of the degrowth discourse, in the following chapters, the educational branch of the sustainability debate will be critically examined and its transformational potentials considered.

3 Critical ESD and critical pedagogy

"[E]ducation is both part of the problem and the solution. […] A society faced with a radical imperative to achieve a socially, economically and ecologically sustainable basis within a historically short time needs to reappraise most aspects of its organization: education – as the main means of social reproduction – has to be at the centre of this task, both as subject and agent."
(Sterling, 1996, p. 18).

The introduction to this study suggested that the educational equivalent to the sustainability debate, Education for Sustainable Development (ESD) is equally as diverse as its parent discourse, SD. The previous chapter on the degrowth debate showed that degrowth is, within the SD debate, a highly transformative stream. The following chapters will explore the critical discourse and endeavor to answer the question: to what extent ESD has been informed by the degrowth debate so far? (RQ2)

Over the past 10 years, the body of official literature on 'Education for Sustainable Development' (ESD) has rapidly grown, and the critical ESD community has grown with it[56]. The purpose of this chapter is to highlight the contributions which have a connection to growth-critical debates (e.g. Vare & Scott, 2007; Selby & Kagawa, 2010; 2015; Lotz-Sisitka et al., 2015, Wals, 2015; Jickling, 2017; Huckle, 2017a), because they contextualize this study. Like degrowth, which has its roots in critical social theory, critical ESD also maintains connections to a critical tradition. Many critical ESD authors have been influenced by Critical Theory[57] or the field of 'critical pedagogy', which will be touched upon in this chapter to clarify the location of critical ESD in the discourse. Others formulate a critique of capitalism and neoliberalism.

The positions differ widely and there is by no means consensus among the scholars. There is unity neither in regards to positions (see Jickling, 2017, p. 20), nor in regards to the distinctions between the different schools of thought, although there are different approaches for structuring the discourse (Vare & Scott, 2007; Wals, 2012; McGregor, 2015; Håkansson et al., 2017).

There are other parts of the ESD community that are not explicitly critical, but are, like the general SD debate, located in 'status quo' or 'reform' positions towards sustainability. Selected works of this community will also be introduced and discussed in chapters 5-7, alongside the empirical results of this study. Nevertheless, the focus of this study is the critical ESD community.

The following sections include concrete points of critique within the ESD discourse (section 3.1). These extend to a critical assessment of the role and function of ESD in regards to current educational practices, policies and systems as well as its potential for the transformation of the same (section 3.2).

[56] In this study, especially literature in English is part of the reasoning, German texts are only integrated to a very limited extent.
[57] John Huckle (e.g. 1993; 1996; 2012a; 2017), as well as other early contributors (such as Fien and Sterling), has reasonably contributed with reasoning grounded in Critical Theory (Huckle, 1993, p. 43) and Marxist' perspectives to the discourse of ESD (back then EE).

This includes broader transformative perspectives, and what McGregor (2015) calls different 'counter-communications'[58] to the dominant ESD discourse. Moreover, the following sections address the demand to 'remake' education as a foundation for developing conceptually strong responses to the educational imperatives of the ecological crisis and human-nature relationships (see Jickling & Sterling, 2017, p. 2)

Terminology

In most official documents, the term ESD is usually used (e.g. UNESCO, 2014c; UNESCO, 2017b). However, the term is contested. In the past decades, much effort was invested by critical scholars to shift the term ESD towards something more adequate, their objections arising from conceptual differences (partly outlined in the following sections). As a result, there is a plurality of terms other than ESD that are part of the body of ESD literature.

Some such terms are, for example, 'Environmental Education' (EE), 'Sustainability Education' (SE), 'Education for Sustainability '(EfS) (Huckle, 1996; Sterling, 1996; Fien, 2001), 'sustainable education' (Sterling, 2010) and, in a rather recent development, 'Environmental and Sustainability Education' (ESE) (see Wals et al., 2017, p. 25)[59].

Nevertheless, ESD is still the term that is mostly applied. Many scholars suggest that the debate should now move on from disputes over 'empty signifiers' towards a 'remaking' of education (Jickling & Sterling, 2017, p. 3) and addressing the core educational challenges identified in the debate (e.g. Michelsen & Fischer, 2016, p. 330). This thesis aims to contribute to such challenges, more specifically to the clarification of the role of economic growth in ESD.

The majority of the third chapter concerns itself with the *critical* educational discourse about and within ESD. This study acknowledges the work that has been accomplished by such debates on terminology but, for the sake of the reader's welfare, subsumes all of these critical approaches under '*critical* ESD'. This stands in opposition to 'mainstream ESD' in most *official* positions.

[58] Other scholars (Kagawa and Selby, 2015) call this the 'borderlands' of ESD: those spaces of emancipation from dominant culture patterns towards "resistance, reconfiguration and renewal" (Kagawa & Selby, 2015, p. 13).

[59] In 2010, Sterling suggested SE as a 'catch-all' of EE, ESD and education for sustainability (EfS) (Sterling, 2010, p. 512). Wals et al. (2017) suggest that the periods of EE and SE have ended: EE in the late 1970s and SE with the end of DESD in 2014 (Wals et al., p. 25).

3.1 Critical ESD and its points of critique

In the explicitly critical ESD community, there is a long tradition of growth critique. However, some authors point out that ESD, like SD in general, is fundamentally grounded in the idea of economic growth (e.g. Berryman & Sauvé, 2016, p. 110). And, as is the case with the general SD discourse, the neoliberal logic and orientation towards economic growth prevalent within the ESD discourse is considered by many to be "a hegemonic force blocking transitions towards genuine sustainability" (Huckle & Wals, 2015, p. 491).

This question of the incongruity of economic growth and sustainable development remains one of the biggest controversies in both the general sustainability discourse (see Grunwald & Kopfmüller, 2012, p. 68) and the ESD discourse.[60] According to Selby & Kagawa, the majority of ESD programs created thus far offer "little by way of antidote to the growth machine by opening learning windows or considerations of ideas for transition slow growth, no growth and steady-state economics" (Selby & Kagawa, 2011, p. 25). There are only very few contributions that link education and degrowth. They are outlined in detail in the third section of this chapter (3.3).

Some of the more prolific authors in the critical field (see introduction, 'aim of the study') are John Huckle, Helen Kopnina, Lucie Sauvé, Heila Lotz-Sisitka, David Selby, Stephen Sterling and Arjen E. Wals (alphabetical order, without being exhaustive). The points of critique regarding the imprint of economic growth on ESD overlap significantly with the critique of neoliberalism and capitalism in ESD and are therefore described together.

In the following paragraphs, some more specific and detailed points of critique within the critical ESD community are outlined that nevertheless also relate to the problem of economic growth in ESD. In addition to the arguments emerging from the critical ESD community, elements of the 'general' critical pedagogy debates will be integrated whenever appropriate.

Excursus 3: Critical pedagogy

Critical pedagogy has been influenced by Critical Theory. Building on similar assumptions as those of Critical Theory, critical educators (e.g. Kincheloe, 2004; 2008a; Giroux, 2011; Apple, 2013) see the need to both criticize *and* transform the social system, the educational system in particular (see Thompson, 2004, p. 41). Critical pedagogy considers how the 'enslavement' of people by ideological and cultural forces (Horkheimer 1982, p. 161) relates to educational processes and systems.

In criticizing the underlying logic of exploitation of education, scholars of critical pedagogy are concerned with the hegemonic relations of education and power (see Mayo, 2015, pp. 131). They deal with the *ideology* underpinning education within a

[60] The *Greenpeace Nachhaltigkeitsbarometer* suggests that sustainability issues are on the rise within schools (Michelsen et al., 2015, p. 185). However, research and data is lacking on how young people orientate themselves within the growth critical debate (see Michelsen et al., 2015, p. 188).

society and the logic that results for educational processes (see Kincheloe, 2004, p. 46; Giroux, 2011, p. 6). Critical educators (e.g. Huckle, 2017a, p. 71) assume that, as knowledge is constructed within the dominant social reality, it is therefore always 'biased' by its cultural setting.

Some typical questions posed by critical pedagogy include: Whose interests are represented in the educational system? Whose culture dominates the curricula, contents and goals of education? What economic and historical processes shaped the development of the educational system? (see also Kincheloe, 2004b). Finally, the importance of resisting dominant power by exposing and contesting any of its more oppressive forms, such as the exploitation and marginalization of people, is highlighted in critical pedagogy (see ibid., p. 34).

Concrete proposals for the learning process are often learner-centered, in the sense that objectives and contents are up for negotiation and learning is mainly experiential (see Huckle, 2017a, p. 71). In critical pedagogy, educators are charged with supporting learners in uncovering the underlying mechanisms that influence their own learning processes (see Kincheloe, 2008a, pp. 30) as well as creating space for counter-narratives.

Critique of economic growth and neoliberalism in mainstream ESD

The introduction of this study refers to philosopher David Orr's observation that "without significant precautions, education can equip people merely to be more effective vandals of the earth" (Orr, 2004, p. 5) "and of each other" (Orr, 2017a, p. x).

It is clear that higher levels of education – by increasing individuals' economic power (resulting in higher levels of consumption, commodity fetishism, etc.) and acting as a driver of development via the creation of new industries (such as the now-titanic tech sector) – often contribute to unsustainable living practices (see UNECE, 2012, p. 6)[61]. Sterling argues that, even more problematically, education contributes to the prevention of socio-ecological transformations and can therefore be considered a stabilizing and reproductive factor to unsustainability (Sterling, 2017, p. 34).

The perspective of critical pedagogy supports this observation as well. One basic assumption is that all levels of schooling as well as the educational system, especially in OECD countries, are dominated by economic interests. One example for such aspirations on the political level is for instance the Lisbon Strategy by the European Union that aspired to make Europe "the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth"[62] (European Parliament, 2000). The strategy was underpinned by massive investments in the 'knowledge-based economy' and

[61] Wals et al. (2017) point out that the Global Education Monitor Report (2016, p. 12) indicates that education already meets the dystopian formulation of David Orr - that it already equips us to be more effective vandals of the Earth and each other (Orr, 2017a, p. x). "[E]ducation can be highly problematic when it merely amplifies those capacities in people and those systems and structures in society that accelerate unsustainability" (Wals et al., 2017, p. 25).

[62] http://www.europarl.europa.eu/summits/lis1_en.htm, Date of Access: 31.05.2019

educational systems up until 2010. Some authors therefore speak of 'neoliberal education' (e.g. Giroux, 2011, p. 8). They argue that unsustainability is reproduced by formal educational institutions, especially schools. This includes the reproduction of power structures and patterns of unsustainable consumption that support the existing political and economic systems (e.g. Kincheloe & McLaren, 2005, p. 309; Giroux, 2011, p. 5; Huckle, 2017a, p. 68).

The critical community in ESD suggests that not only education in general but also 'mainstream' ESD is contributing to the problem of unsustainability (Sterling, 1996, p. 18). Much of the critique of ESD revolves around an ambivalence towards official educational approaches subsumed under the label of ESD. To its credit, ESD has contributed to the successful implementation and dissemination of sustainability-related questions and endeavors within the educational 'mainstream' (see Sterling, 2017, p. 39) and educational systems (see Michelsen, et al., 2015, p. 4). It is precisely through its conformity to many common practices and beliefs that ESD has been able to gain broad social and political acceptance and increase its own visibility. The downside of this however, is that "[m]ainstream ESD […] uncritically embraces economic growth, globalization and consumerism" (Huckle, 2012b, p. 365). The main concern is that much of ESD is "underpinned and energised by an internationally hegemonic neoliberal ideology" (Sterling, 2017, p. 33).

Berryman and Sauvé (2016) argue that proponents of mainstream ESD have defined it as "a process of critical thinking and collaborative learning, [which] values the different approaches of a progressive education." With regard to their strategies, however, "SD & ESD are fundamentally grounded in a cosmology and a cosmopolitics of economic growth" (Berryman & Sauvé, 2016, p. 110). By uncritically accepting predominantly market-compliant positions that are based on the assumption that sustainability goes hand in hand with economic growth, mainstream ESD advocates tend to avoid radical thinking (see Selby & Kagawa, 2010, p. 42). Selby argues that authors who embrace such mainstream understandings are servants to the growth paradigm, despite their best intentions, because they have "a sleepwalked attachment to a distorted value system that is fueling rampant […] climate change" (Selby, 2010, p. 38).

The critical community argues that the process of mainstreaming ESD in political and educational agendas has in the past decades led to "neutering by the same mainstream" (Sterling, 2017, 39).[63] As a result, the critical community argues, mainstream ESD is supportive of the current economic paradigm and only suggests modifications within the existing paradigm rather than challenging the paradigm itself (see Sterling, 2010, p. 512).

[63] Huckle (2012a) argues that "[...] the majority of ESD, much of it sponsored by governments and corporations, is unrealistic, functions as ideology, and contributes to what has been termed the 'closing circle of ESD'" (Huckle, 2012a, p. 44). The critique of the 'closing circle' was utilized earlier in the EE debate. According to Selby and Kagawa (2010) ESD is "part of a 'closing circle' in which, over a period of more than 30 years, environmental education (EE) has been progressively straitjacketed while being enlisted as 'a means of implementing a globalized mix of (highly questionable) agendas'" (Selby & Kagawa, 2010, p. 38).

Example: Critique of the UNESCO Decade of Education for Sustainable Development (DESD)

Much of the critical community's critique addresses the blind spots within mainstream ESD programs regarding systematic barriers to sustainability, especially neoliberalism.

Many such scholars (e.g. Selby & Kagawa, 2011; Huckle & Wals, 2015) have been critical of the practices used by UNESCO in its Decade of Education for Sustainable Development (DESD), which ran from 2005-2014 and was referred to in the introduction of this thesis. By promoting the DESD, UNESCO was identified as key agency to promote the model of neoliberal globalization with education (Selby & Kagawa, 2011, p. 22).

According to Huckle and Wals, the DESD was "business as usual in the end" and has failed "as far as challenging neoliberalism" (Huckle & Wals, 2015, p. 502). This is merely due to blind spots. Huckle and Wals analyzed DESD resources systematically and suggest that assessments of ESD that are critical of growth and neoliberalism are excluded in final reports of the DESD (ibid., p. 497).

> *"too little attention to power, politics and citizenship; the ways in which neoliberalism has made the adoption of sustainable behaviors and lifestyles less likely; what alternative forms of social and environmental relations (political economy) would aid their realization; and whether students should consider liberal and radical views of social change alongside the reformist, and sometimes idealist views reflected in the literature of DESD." (Huckle & Wals, 2015, p. 492).*

Consequently, it is mostly the passivity towards more critical, systemic issues that makes the DESD a driver of neoliberalism. The UNESCO DESD has been criticized for being uncritical with the paradigm of growth. Nevertheless UNESCO is a very diverse organization and in other contexts they are moderately critical of growth. The objectives of ESD as indicated on the UNESCO ESD website include to "create sensitivity to the potential and the limits of economic growth" (UNESCO website 2018[64]).

UNESCO is not unified in its position towards the growth paradigm. 20 years after the influential Delors report, UNESCO reconsidered their educational concept in the 2015 report "Rethinking Education. Towards a global common good?" (UNESCO, 2015). In this report, they re-emphasize the four pillars as formulated in the Delors report but openly criticize economic growth as the guiding principle[65]. They suggest that a

[64] Quoted from: http://www.unesco.org/new/en/education/networks/global-networks/aspnet/study-areas/education-for-sustainable-development/, *Date of access: 31.05.2019*.

[65] "Ensuring growth has long been understood as the purpose of development, based on the premise that economic growth generates positive effects that eventually guarantee greater well-being for all. However, unsustainable patterns of production and consumption point to fundamental contradictions in a dominant model of development focused on economic growth." (UNESCO 2015, p. 21). However, Lotz-Sisitka criticized this UNESCO report, arguing it has a vague conception of 'common good' and that it left the relation between 'education', 'commons' and 'common good' "still open to be explored in further detail" (Lotz-Sisitka, 2017, p. 47).

"humanistic and holistic approach to education […] can contribute to achieving a new development model. In such a model, economic growth must be guided by environmental stewardship and by concern for peace, inclusion and social justice […] Regarding education and learning, it means going beyond narrow utilitarianism and economism to integrate the multiple dimensions of human existence."
(UNESCO, 2015, p. 10)

Due to the conflict arising between these diverse positions it is imperative that the current Global Action Program of ESD (GAP), prioritizes "serving people and the planet, rather than just serving the economy" (Wals, 2017, p. 26).

Example: Acceptance of the neoliberal assessment agenda

Economic growth and competitiveness fostered by education are broadly believed to be crucial to individuals' wellbeing, inclusion and social cohesion. As the OECD Secretary-General Gurría stated in 2014: "Education and skills hold the key to future wellbeing and will be critical to restoring long-term growth, tackling unemployment, promoting competitiveness, and nurturing more inclusive and cohesive societies" (Gurría, 2014, p. 15, cited in Sterling, 2017, p. 33).

Critical pedagogy holds that competitiveness is often generated by the tests, assessments and comparison tools that are standard in neoliberal education. Vignoles argues that this competitiveness is also encouraged by the ways in which standard economists (and politicians) evaluate educational systems with measures such as ‚efficiency' or ‚inefficiency' with regards to the "long-run economic value of education" (Vignoles, 2012, p. 91).

According to Sterling, indicators for this view in education are, for instance: a focus on economic success, an emphasis on employability and competition, the key driver of learning motivation being "employment prospects", increasing pressure to perform in tests, expert-driven pedagogy and the enhancement of the performance of institutions according to market-logic (Sterling, 2017, p. 34). Such indicators are part of global educational surveys such as the OECD PISA (Program for International Student Assessments) survey.[66]

The neoliberal assessment agenda in educational systems is not only criticized by the critical pedagogy community but also by critical ESD scholars. They argue that concurrent with the neoliberal imprint of the dominant economic paradigm on ESD is the acceptance neoliberal educational standards, benchmarking systems and measurement methods (see Jickling & Wals, 2008, p. 6). Sterling suggests that the 'global testing culture' functions as a means of fulfilling neo-liberal economic purposes (Sterling, 2017, pp. 33).

'Mainstream' ESD is considered to serve the hegemonic *modus operandi* "via targets and indicators, a preoccupation with the tangibles of

[66] By implementing the PISA testing, the OECD has successfully globalized the competency orientation in educational systems (see Klieme et al., 2008, p. 8). This is one reason among others why the competency orientation in education is controversial among critical scholars (see more on competence orientation in chapter 6).

standardisation and measurement" (Huckle, 2012b, p. 365). This is observable not only in learning assessments, but also in related characteristics of this logic can be found in ESD by e.g. preferring individual rather than collective action and the promotion of economic entrepreneurship etc. (see Fletcher, 2016, p. 3).[67]

The OECD 'global competence' framework, a framework related to ESD (OECD, 2018, p. 5; 10) is another example for the neoliberal logic in education. The logic is visible when the authors describe that their framework is necessary for "employability in the global economy" (OECD & Asia Society, 2018, p. 10) or that "[e]ducating for global competence can boost employability" (OECD, 2018, p. 5).

The examples given in this section clearly show how ESD is at risk of being both ignorant of the core challenges facing sustainability and in thrall to the neoliberal agenda. More examples will be given thoughout chapters 5-7, including the most striking example of the neoliberal application of ESD in the context of the SDGs (UNESCO 2017a) is given in detail in section 5.2.

Huckle argues that ESD tacitly endorses "the very ideologies and political–economic arrangements that are responsible for producing or exacerbating conditions of poverty, injustice, and unsustainable development" (Huckle, 2017a, p. 67). This is, ironically, in direct contradiction of the stated aim of ESD to contribute to positive socio-ecological transformations. In these contradictions, Huckle sees one "key strateg[y] of neo-liberalism" (ibid.), one which operates by de-radicalization, de-politicization, or co-optation, often hindering radical projects.

Critique of the contradictions caused by the hidden curriculum

One point of critique worth mentioning at this point in time comes more from the perspective of critical pedagogy than critical ESD. This point concerns itself with how the so-called "hidden curriculum" (e.g. Giroux & Penna, 1979; Wren, 1999) creates contradictions in educational processes. This concept of the hidden curriculum explores how ideas not contained within the official curriculum of formal education institutions are transmitted to learners. This may take place via school or classroom cultures, routines, assumptions, behavioral standards, etc. These ideas are, mostly unconsciously or unintentionally, sent by educators or institutions and become embedded in the social sphere and the values in educational systems (see Wren, 1999, pp. 594).

[67] Fletcher (2016) identifies the following 'neoliberal characteristics' in environmental education (Fletcher, 2016, p. 3): "Emphasis on individual rather than collective action as the basis for pro-environmental behavior, [p]romotion of entrepreneurship as the economic and social form appropriate to sustainability, [e]ndorsement of a model of environmental citizenship centered on privatized and individualized activities, [a]dvocacy of economic growth to address both poverty alleviation and environmental protection, [p]romotion of new public management (NPM) strategies in both educational and environmental governance, [e]mphasis on quantitative measurement as the basis for transparency and accountability in environmental management, [r]elated promotion of standardized testing for learning assessment, [e]mbrace of rewards systems to incentivize participation and learning, [a]dvocacy of superficial participation without concrete decision-making power or equitable resource sharing, [f]ocus on the economic value of 'ecosystem services' as justification for environmental protection, [p]romotion of market-based instruments for environmental governance" (ibid.).

The hidden curriculum is a result of informal learning processes (e.g. Giroux & Penna, 1979; Wren, 1999). While education is often defined as a "deliberate and organized process of learning" (UNESCO, 2015, p. 79)[68], not all forms of *learning*[69] are deliberate. Learning can be seen as taking place in three different configurations: formal, non-formal and informal (see Overwien, 2009, p. 26). While formal learning relates to all intentional educational processes in academic institutions (school, universities, etc.) and non-formal learning to intentional education outside of institutions (e.g. by associations, NGOs, trainings, workshops etc.) (Overwien, 2009, p. 26), informal learning is *unintentional* (Cedefop, 2011, p. 85). It occurs through our daily experiences, such as workplace or familial interactions, social movements, or media and advertising (see Overwien, 2009, p. 26). "It is not organised or structured in terms of objectives, time or learning support" (Cedefop, 2011, p. 85). Eraut (2000) suggests that informal learning is crucially important for the development of individuals' beliefs, attitudes and worldviews, and that to only focus on explicit learning would fail to recognize the complexity of learning in its social context (Eraut, 2000, p. 131).

We are all indelibly influenced by unintentional, informal learning processes every day. In the context of educational institution, they co-exist alongside formal learning processes and, collectively, give rise to the hidden curriculum. For critical educators, the hidden curriculum is a mostly problematic phenomenon, as contradictions often arise when the official curriculum and the hidden curriculum clash. According to Kincheloe (2004), one such contradiction is the teaching of cooperative values using (inherently competitive) test-driven curricula. Another is the explicit promotion of democratic values by institutions that are themselves authoritarian and strictly hierarchical (see Kincheloe, 2004, p. 1.) Giroux and Penna suggest that the hidden curricula can work against the creation of democratic and social education and therefore feed contradictions in educational systems (Giroux & Penna, 1979, p. 38).[70]

Also in critical ESD, informal learning processes and the 'hidden curriculum' play a crucial role in the debate (see Stoltenberg & Burandt, 2014, p. 582). Authors emphasize how contradictions in ESD lead to 'cognitive dissonances'. Cognitive dissonances are described by Selby as "processes in which the human psyche, while to a greater or lesser extent rationally acknowledging

[68] Marotzki (1990) points out the difference between 'learning' and *'Bildung'* (education): *Learning processes* occur when knowledge or skills are accumulated into an existing frame of reference (see Marotzki, 1990, p. 52), while processes that actually transform the frame of reference are called '*processes of Bildung'* (ibid.).

[69] This study builds on an interlinked UNESCO differentiation to knowledge and learning: "Knowledge is central to any discussion of learning and may be understood as the way in which individuals and societies apply meaning to experience. It can therefore be seen broadly as the information, understanding, skills, values and attitudes acquired through learning. As such, knowledge is linked inextricably to the cultural, social, environmental and institutional contexts in which it is created and reproduced. […] Learning is understood here to be the process of acquiring such knowledge. It is both a process and the result of that process; a means, as well as an end; an individual practice as well as a collective endeavor" (UNESCO, 2015, pp. 16).

[70] Another explanation for this phenomenon on the more systemic level in education is given by German educational scientist Helmut Peukert. For Peukert, (1) the concept of education is reduced towards maintaining a society that should actually be transformed, (2) educational institutions and schools in particular are built on selection and qualification and aim to integrate young people into the existing society while they should intend to nudge transformative learning and (3) educational/pedagogical relationships aim to assess learning according to given criteria of performance, while education should aim at the individual development of the learners (Peukert, 2015, p. 324).

the threat we face, uses devices such as displacement, prevarication, deviation, short-term gratification and quixotic hopefulness to avoid or slow an appropriate and proportionate response" (Selby, 2015, p. 29).

One vast but fundamental argument is that every attempt to integrate ESD into the existing system without the intention of changing the system itself can only fail because it leads to cognitive dissonance (see Selby & Kagawa, 2010, p. 42; Sommer & Welzer, 2014, p. 38; see also Selby, 2015, p. 29). Orr (2017a) argues that every learner should acquire a 'basic comprehension' of certain crucial topics relevant to strong sustainability, such as 'environmental ethics' or 'steady-state economics' (ibid., p. 14, see chapter 4.3). But, even if learners are empowered to think critically and act democratically and mindfully, the social reality remains committed to the dogma of economic growth, "as if it could continue forever" (Orr, 2017b, p. 439).

Such contradictions and dissonances sustain learners' "uncritical continuation of and installation in lived contradictions" (Sommer & Welzer, 2014, p. 38, my translation) which are especially problematic in the context of consumption patterns. One example of the hidden curriculum in ESD is therefore, that ESD often focuses on sustainable consumption while students continue to consume in unsustainable ways (e.g. eating conventionally produced vegetables while talking about organic food production in the classroom).[71] Huckle, drawing on Critical Theory, describes how such dissonance-producing mechanisms contribute to alienation, which then acts as the primary driver of consumerism - "the means by which capitalism seeks to provide compensatory meaning and purpose to life" (Huckle, 2012a, p. 38). In this way, ESD can even amplify contradictions that result from informal learning processes.

Critique of instrumentalizing learners

Building on the idea that neoliberal ideology is embedded in both educational systems in general and mainstream ESD approaches, many consider that there is an instrumentalizing tendency on the part of education (Sterling, 2017, p. 34). Critical ESD and also critical pedagogy roundly condemn this instrumentalization of learners.

Unlike the critical pedagogy community, whose critique focuses mainly on the ways in which learners are openly or secretly influenced by economic interests, much of the work of the critical ESD community deals with the issue of the legitimacy - or not - of openly educating 'for' sustainability.

Soon after the emergence of ESD, Jickling's essay 'Why I Don't Want My Children To Be Educated for Sustainable Development' (1992), was

[71] 'Global Learning' (GL) as one of the very close sister disciplines to ESD has also been criticized for causing contradictions (Danielzik, 2013; Glokal e.V., 2013). There are a number of meta-analyses of GL, ESD etc. that indicate that many mainstream documents and programs ignore topics such as colonialism, capitalism and exploitation in their materials (Glokal e.V., 2013, p. 4) and therefore bear the risk of uncritically reproducing racism, stereotypes, post-colonial perspectives. Huckle (2017a) argues that GL can only describe itself as critical when it features this search of radical alternatives (as the abovementioned social movements) as a replacement of global capitalism (Huckle, 2017, pp. 63).

published, criticizing ESD for being prescriptive and for aiming to instrumentalize students in the establishment of sustainable norms and values (Jickling, 1992, p. 8). His contribution was the initial spark for a heated debate in the critical community in the years that followed. Some classified education 'for' the environment to be deterministic, programmatic and ideological. (e.g. Jickling & Spork, 1998, p. 323).

As the debate over instrumentalization continued, the critical ESD community began to classify and systematize different forms of ESD. This resulted in distinctions such as:

- *ESD 1* (instrumental) vs. *ESD 2* (critical-emancipatory) (Vare & Scott, 2007)
- *ESD-* (instrumental) vs. *ESD+* (emancipatory) (Wals, 2012)
- *Authorative & transmissive* vs. *participatory & socio-constructivist, transformative* (Jickling & Wals, 2008)
- *Dominant social paradigm (DSP) (instrumental-behaviorist)* vs. *new environmental paradigm (NEP) (intrinsic)* (Sterling 1996; 2010)
- *Idealistic (reformist)* vs. *realistic (radical)* (Huckle, 2012a, p. 98; 2012b, p. 102)

All of these conceptions have their differences, and although the terminology may vary, there is a general consensus on the distinction made between instrumental approaches (represented on the left of each of the above bullet points) and emancipatory approaches (represented on the right). Instrumental approaches are seen as symptomatic of ESD's domination by mainstream economics and culture and rely on the idea of 'weak' sustainability. Such perspectives are usually contested by the critical community[72]. Emancipatory approaches, by contrast, are informed by the concept of 'strong' sustainability.

Although this thesis focuses primarily on the distinction between *instrumental* ESD 1 and *critical-emancipatory* ESD 2 perspectives (Vare & Scott, 2007, p. 192), it also introduces the more elaborate heuristic of *authorative & transmissive* vs. *participatory & socio-constructivist, transformative* education (Jickling & Wals, 2008).

Excursus 4: The 'purpose' of education in society

'Instrumentalizing' perspectives of ESD are contested, especially when they are considered from the perspective of '*Bildung*' (education). Since around 1800, in the neo-humanist tradition of Wilhelm von Humboldt, education has been a field that deals with

[72] There are certain positive notions about 'instrumental' perspectives (e.g. Kopnina, 2017, p. 130), and the idea that ESD researchers should move beyond the fear of indoctrination. Kopnina (2015) argues that values of a 'more open' education are also a form of indoctrination and that the imprint of values is unavoidable (Kopnina, 2015, p. 124). Some authors argue that although instrumental perspectives are contested and could ultimately lead to an eco-totalitarian society, a growing urgency in global problems "may require quick instrumental responses to change people's lifestyles and behaviours" (Wals, 2015, p. 7; see also Sterling, 2010, p. 522).

the purpose of education and pedagogical critique. In such neo-humanist understandings, education is usually described as a free and independent means of self-development. In Humboldt's conceptualization, the ultimate aim of a person's existence "is the highest and most harmonious development of his powers to a complete and consistent whole" (von Humboldt, 1854, p. 11). Even today, UNESCO subscribes to this humanistic conception of education: "Sustaining and enhancing the dignity, capacity and welfare of the human person, in relation to others and to nature, should be the fundamental purpose of education in the twenty-first century" (UNESCO, 2015, p. 36).

Alongside von Humboldt's idea of the development 'of human powers', another key consideration is the interplay in education between ourselves as individuals and the world around us (see Koller, 2012, p. 12) Thus, education must always be considered in light of its social dependencies and its social effects. John Dewey later argued that education takes place at the interface of individual self-expression (ourselves) and its social purpose (the world around us).

Dewey is often considered in the context of the societal purpose of education, based on his work on democracy and education. For Dewey (1966), democracy does not represent a system of government, but a form of individual and collective negotiation required for organizing a community. This includes self-development and autonomy – the emancipation of mind – as well as the development of the social context and all spheres of 'modern' life (see Dewey, 1903, p. 193)[73].

Example: 'Weak' ESD 1: instrumental/authorative & transmissive education

Vare and Scott labeled forms of ESD that aim to promote sustainable ('correct') attitudes and routines among learners as 'ESD 1' - an *instrumental* education *'for'* sustainable development (Vare & Scott, 2007, p. 193). Most official and political publications on ESD use the approach of 'ESD 1', such as is seen in documents produced in the context of the DESD (ibid.). The 'ESD 1' approach is easy to clearly communicate for official stakeholders. It posits that ESD could be a 'tool' for both the scientific community and the creation of politically desirable pathways to socio-ecological transformations (see UNESCO website 2018[74]).

A *transmissive* conception of education is similar to the instrumental perspective (Vare & Scott, 2007, p. 193), in that it is a rather unidirectional transmission of facts, skills and values, and it sees the role of education as enabling social reproduction (see also Huckle, 2012a, p. 38) and efficiency (Jickling & Wals, 2008, p. 7). Education is considered an instrument for installing the educator's message or 'agenda' in the learner's minds. The goal of the educational process is prescribed, mostly by governments, industries or special interest groups (see ibid.). Both transmissive and instrumental approaches to ESD are

[73] "Modern life means democracy, democracy means freeing intelligence for independent effectiveness - the emancipation of mind as an individual organ to do its work. We naturally associate democracy, to be sure, with freedom of action, but freedom of action without freed capacity of thought behind it is only chaos. If external authority in action is given up, it must be because internal authority of truth, discovered and known to reason is substituted" (Dewey, 1903, p. 193).

[74] Quoted in: http://www.unesco.org/new/en/education/networks/global-networks/aspnet/study-areas/education-for-sustainable-development/, *Date of access: 31.05.2019*.

widely considered to conform to a 'weak' sustainability position (see Selby & Kagawa, 2010, p. 42).

One recent example of 'weak' instrumental ESD is the application of ESD in terms of the SDGs (UNESCO GAP, 2018). According to the authors of the UNESCO GAP policy briefs, "education is also understood as a highly effective means of implementation across all of the [SDGs] by serving as a vehicle to raise awareness, increase knowledge, and develop capacity of actors around the world to play active roles in the work of the 2030 development agenda" (UNESCO GAP, 2018, p. 2). On the UNESCO ESD website, ESD is described as a "tool for addressing interlinked objectives" (UNESCO website 2018[75]).

When analyzing official perspectives, it should be kept in mind that such contributions are usually authored or co-authored by researchers who also integrate critical perspectives in their other work. However, it is sometimes pragmatically necessary to adopt the official policy perspectives (see also Jickling & Wals, 2008, p. 12).[76] Regardless of the intentions of the authors, the description of education as either a "tool" (ibid.) or as "serving as a vehicle" (UNESCO GAP, 2018) reveals an instrumentalizing logic behind the advancement of the SDGs.

Example: 'Strong' ESD 2: critical-emancipatory/participatory & socio-constructivist, transformative education

Opposing instrumental ESD 1, Vare and Scott describe a second kind of ESD, one which is critical-emancipatory: education *'as'* (as opposed to 'for') sustainable development (ESD 2) (Vare & Scott, 2007, p. 194). Critical-emancipatory 'ESD 2' focuses on the critical consideration and discussion of the values, norms and guiding principles of a society. It is also called '*intrinsic* ESD' (Sterling, 2010, p. 522). The aim is a qualified level of critical reflection that empowers learners to undergo an 'inner change' and become critically aware, reflective and autonomous (ibid.). This is in stark contrast to instrumental ESD, which aims to 'transmit' the 'right' set of values, norms and behavior to learners. 'ESD 2' authors describe their educational purpose to be enabling learners to, for instance, acknowledge a plurality of positions and opinions and to critically participate in political and public discourses, as well as handle "complexity, uncertainty, ambiguity and loss of identity and sense of place, in a meaningful, ethical and caring way" (Wals, 2015, p. 7).

In a *transformative, socio-constructivist* conception of education and learning, which is closely aligned to the critical-emancipatory perspective

[75] Quoted from: http://www.unesco.org/new/en/education/networks/global-networks/aspnet/study-areas/education-for-sustainable-development/, *Date of access: 31.05.2019*.

[76] Being instrumental does not automatically exclude or include the ability to be socially critical. Jickling and Wals (2008) suggest that highly critical approaches can be critical *but* instrumental or prescriptive (Jickling & Wals, 2008, p. 12; see also Jickling & Spork, 1998, p. 323).

(Vare & Scott, 2007, p. 194), learning is based on the assumptions of socio-constructivism, meaning it is co-constructed in a social context and based on the idea of allowing space for autonomy and self-determination on the learner's side (see Jickling & Wals, 2008, p. 7, see more on constructivism in section 3.2). This co-constructive approach enables learners to participate democratically in their own education.

Jickling and Wals build on Dewey's ideas (see excursus 4) to develop two contrasting conceptions of what an *'educated' citizen* ought to be, according to the two diametrically opposed ESD forms. They depict the ideal 'educated' citizens of emancipatory ESD as 'democratic practitioners', in line with this transformative conception of education, which attempts to form individuals who are constantly involved in shaping and transforming their communities as active participants in an ongoing process (ibid., p. 8).

> *"[W]e maintain that education, including environmental education, is not just about social reproduction, but also, and perhaps foremost, about creating the ability to critique and transcend social norms, patterns of behavior, and lifestyles without authoritatively prescribing alternative norms, behaviors, and lifestyles."*
> *(ibid.).*

They distinguish this idea of an *'educated' citizen* from that which corresponds with transmissive and instrumental conceptions of education, which imagine individuals that are:

> *"well prepared to accept their role within society and the workforce. They are obedient, deferential, and compliant as they take their place within hierarchical and authoritative social structures and power relationships. From this vantage point, individuals are content to participate in democratic processes at electoral intervals while daily choices are made by decision-makers and their supporting bureaucracies."*
> *(ibid., p. 8)*

In summary, they suggest that a transformative conception is "more about teaching students how to think than what to think" (ibid., p. 12), whereas an instrumental conception is more focused on generating an orthodoxy. The authors suggest that their heuristic could be used as a critical tool to evaluate new initiatives[77] in regards to non-conformism (ibid., p. 19).

Different authors identify that the overarching commonality among the critical "counter-communications" (McGregor, 2015, pp. 267) in ESD is that they prefer the model of 'strong' sustainability over the 'weak' model and the 'Brundtland Mantra' (e.g. Huckle, 2012b, p. 364; McGregor, 2015, pp. 267; Wals et al., 2017, p. 23). Examples of such counter-communications will be introduced in further detail in the section on transformation (3.2).

[77] Their heuristic was recently applied with the attempt to position research approaches in ESD between the two axes of a) 'authoritative/focusing on matters of fact' – 'co-defined/focusing on matters of concern' and b) 'pre-defined/prescribed' – 'open-ended/emergent' and resulted in clustering the approaches in 'science-oriented', 'policy –oriented', 'organization/management-oriented' and 'transition/transformation-oriented' (Macintyre et al., 2017, p. 82).

3.1.1 Synthesis: Critical ESD and its points of critique

In the critical community, there seems to be an overall consensus that ESD as it is seen in official publications is insufficient as an educational contribution to sustainability. From this perspective, ESD should be re-considered and re-configured if it is going to make a genuine contribution to sustainability. Some of the potential ways in which this might happen from the perspective of critical ESD will be shown in the next section 3.1.

Moreover, this section has argued, in contrast to ESD's aspirations to promote sustainability, it actually serves as a reproductive factor to the unsustainable, dominant economic mode by way of its instrumental conceptions of education.

Thanks to the 'hidden curriculum', unsustainable educational structures themselves also help perpetuate the dominant economic logic – with or without ESD. By adding ESD to education systems, two more contradictory aspects arise: Adding any form of ESD to an unsustainable system is little more than lip service. It is papering over the cracks in a load-bearing wall. Moreover, this 'papering over cracks' approach of 'weak' sustainability suggests a substitutability of capitals, feeding the illusion that sustainability is compatible with continuous economic growth. Mainstream positions or authors that ignore this crucial relation may be seen as 'accomplices' to continuing unsustainability fostered by education (see also e.g. Selby, 2010).

Regardless of their ideas, the daily routines in many formal institutions are unsustainable. Learning about sustainability in unsustainable environments may create dissonance and thus enable learners to install themselves easily within 'lived contradictions' (see e.g. Sommer & Welzer, 2014).

Locating the perspective of degrowth as added value for the critical ESD debate

This section focused on points of critique of mainstream ESD within the critical education community. There are many parallels between these points of critique and those suggested in the degrowth chapter. While degrowth criticizes 'mainstream SD' as an agent stabilizing unsustainability, parts of the critical ESD discourse criticize the educational equivalent, mainstream ESD, for the same reasons (for a similar observation see Berryman & Sauvé, 2016).[78]

Like the degrowth discourse, critical ESD has strong ties to and similarities with a critical discipline that is *outside* of the sustainability debate: While the degrowth discourse draws heavily on Critical Theory, the critical ESD discourse does likewise with critical pedagogy.

[78] A similar observations and approach of comparison of the two discourses were formulated by Berryman and Sauvé (2016) in the form of 'ruling relationships' between SD and ESD.

In summary, for a visual representation of how (and 'where') ESD could potentially be informed by degrowth, Fig. 7 shows the three discourses and how they relate[79]. Critical ESD, critical pedagogy, and degrowth are considered in relation to the two guiding principles of sustainability and transformation, which are displayed as two axes.

The overlap of the three discourses is where the two guiding principles are at their extremes. The depiction of the discourses shown below indicates also what ESD can learn from degrowth. ESD is oriented along the lines of SD and lies in the tradition of the sustainability debate, with only its critical sections in the area of the transformation debate. Critical pedagogy is aligned with Critical Theory and lies in the tradition of the transformation debate, which is mainly independent from the sustainability debate. Only some parts of the debate are oriented along the lines of sustainability. Degrowth can intervene at the nexus of these two positions because it can build on both traditions. It is influenced by the tradition of SD and Critical Theory. It is located at the extreme ends of the axes of sustainability and transformation.

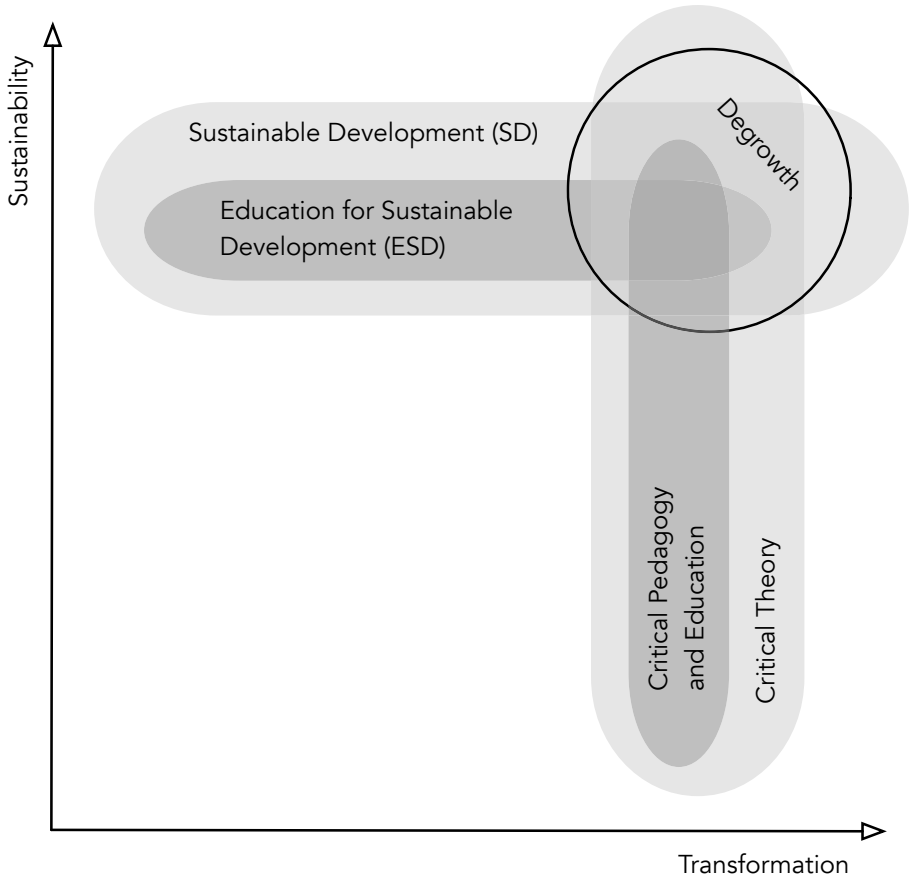

Fig. 7: Mapping of degrowth-informed ESD along the two guiding principles and axes of transformation and sustainability.

[79] This mapping drew inspiration from Hopwood et al.'s (2005) mapping of the SD discourse (see chapter 2).

3.2 Critical ESD and its suggestions for transformation

The previous section made the distinction in ESD between 'weak' instrumental and transmissive approaches of education (ESD 1) and 'strong' critical-emancipatory and transformative approaches of education (ESD 2). ESD 2 is the most effective means by which the critical "counter-communications" (see McGregor, 2015) of the ESD community can contribute to the necessary shift in educational paradigm (e.g. Sterling, 1996, p. 33; 2004, p. 4; 2010, p. 512). The following pages will explore in more detail how this second approach – of education 'as' sustainable development (Vare & Scott, 2007, p. 194), rather than 'for' sustainable development – can be put into more concrete terms.

This section begins with suggestions that are generally considered to be common ground for most parts of the community, such as the promotion of knowledge and competencies using certain pedagogical approaches, or the whole-institution approach to transforming unsustainable routines in formal educational institutions. Despite all the conceptual differences among ESD scholars, Wals identifies certain key principles of purpose, aims and practices of ESD, which may be considered "shared common ground" (Wals, 2009, p. 26). According to Wals, ESD is:

- "a transformative and reflective process that seeks to integrate values and perceptions of sustainability into not only education systems but one's everyday personal and professional life;
- a means of empowering people with new knowledge and skills to help resolve common issues that challenge global society's collective life now and in the future;
- a holistic approach to achieve economic and social justice and respect for all life;
- a means to improve the quality of basic education, to reorient existing educational programs and to raise awareness" (ibid., p. 26).

This section will then move on to introduce more progressive and controversial ideas of the critical ESD community, such as the question of whether and how education can transform society, as well as how "transgressive" (Lotz-Sisitka et al., 2015) learning can become. Certain 'counter-concepts' of critical pedagogy will also be covered here (e.g. Giroux, 2011, p. 5). Of particular interest for this excursion into transformative ESD (3.2) is the issue of how individuals can 'emancipate' (Horkheimer, 1982) or 'liberate' (Freire, 1972) themselves from the hegemony of economic interest and neoliberal capitalism. From the perspective of critical educators, education is understood in its potential to be both part of the problem *and* the solution (Sterling, 1996), due to its role in "socialization into the current hegemonic relations [*and*] its potential for offering […] spaces where these relations can be contested" (Mayo, 2015, p. 135).

All the considerations of the section 3.1. and 3.2 lead to the third section

of this chapter (3.3.), which will introduce examples of authors who explicitly link their educational work to the degrowth debate.

3.2.1 Constituents of transformative ESD

An assumption universal among the ESD community is that the development of knowledge and skills (or competencies) of learners is central for sustainable development. UNESCO describes this as a process "of acquiring knowledge and developing the competencies to apply that knowledge in relevant situations" (ibid.) (UNESCO, 2015, p. 79).

As in the above quotation, acquiring knowledge and developing competencies are often seen to be key constituent parts of ESD. However, there are many others highlighted by the community as important. The following list gives a brief overview of the various approaches to structuring the ESD debate and systematizing the constituent parts – or dimensions – of ESD, such as:

- In an official structuring of ESD, UNESCO differentiates ESD into four dimensions: (1) "learning content", (2) "pedagogy and learning environments", (3) "learning outcomes" and (4) "societal transformation" (UNESCO, 2014c, p. 12).
- Authors in the context of the Swiss agency éducation21 suggest a distinction between (1) subjects/topics, (2) competencies and (3) principles (Gersbach, 2016, p. 5; éducation21, no date, my translation).
- Sauvé highlights that, with a focus on the political dimension, a "know-how-to-act" consists of "knowledge", "know-how" and "attitudes and values" (Sauvé, 2015, p. 108).
- Stoltenberg and Burandt see the conceptual framework of ESD as divided into "learning objectives" for socio-ecological transformations; "values orientation"; "competence orientation"; "knowledge and contents"; "operations", "principles and methods"; and the "learning process" (Stoltenberg & Burandt, 2014, pp. 573, my translation).
- De Kraker et al. see ESD as comprised of "knowledge, skills and values" (de Kraker et al., 2007, p. 103).
- Sterling identified in ESD "five key dimensions: sustainability values; personal and community values; pedagogy; curriculum; and structure and organization" (Sterling, 1996, p. 34).

Overall, such distinctions have overlapping similarities and almost all of them focus on knowledge, competencies and some kind of pedagogical approach. Indeed, competency development has over time become one of the most important debates within the ESD discourse.

While the list above is merely a brief overview, the empirical part of this thesis will go into further detail on three of these dimensions of ESD:

knowledge elements, competency components, and pedagogical approaches. Chapter 5-7 will then explore these three dimensions theoretically and empirically.

Sustainable educational institutions

It is generally assumed by ESD educators that the existing learning environments in formal educational institutions need to be reconsidered and reconfigured. Many authors consider that the structure of institutions is an important factor to consider in the shift towards sustainability (see e.g. Michelsen & Burandt, 2017, p. 45; Singer-Brodowski, no date, pp. 4). UNESCO itself plainly states that, "for ESD to be more effective, the educational institution as a whole has to be transformed" (UNESCO, 2017a, p. 53). So-called *whole-institution approaches* entail not merely the reorienting of pedagogy or methodology, but also changes in operations, institutional culture, facility management, forms of organization and collaboration with stakeholders in the local community (see UNESCO, 2014c, p. 35).

'Whole institutions' are an important component of formal aspirations in ESD (see UNESCO, 2012, p. 45). Building on the considerations of section 3.1 on contradictions of ESD in the formal education sector based on informal learning processes in classroom culture, hidden curriculum etc., one could assume that whole-institution approaches are a good way to reduce such contradictions. Such whole-institution approaches could potentially minimize cognitive dissonances when ESD is implemented as an 'add-on' in existing structures and institutions that maintain unsustainability (see Selby & Kagawa, 2010, p. 42; Sommer & Welzer, 2014, p. 38; see also Selby, 2015, p. 29). However, a recent meta-analysis shows that 'sustainable schools' do not always expand beyond scratching the surface and do not yet meet the challenges of socio-ecological transformations in terms of attitudes and practices of the learners (Niebert, 2018, pp. 64).

However, in the monitoring of Germany's implementation of the ESD GAP the transformative potential of whole-institution approaches was emphasized, along with the role of non-formal and informal learning in such processes of transformation (Singer-Brodowski, no date, pp. 4). The linking of non-formal, informal and formal learning processes using the whole-institutional approach appears to be one potential leverage point in the transformation of the educational system (ibid.).

'Alternative education' approaches may also add value to the debate on sustainable institutions. Authors in that field argue that alternative forms of education could prevent the reproduction of the contradictory mechanisms permeating the formal education system. The discourse on 'alternative education' is not covered here in detail, but, drawing on the work of Warwick (2012), some of the most important principles of alternative education's holistic approach

have been outlined. They are:

- Strong relationships within educational settings and small groups of learners (ibid., p. 220).
- Autonomous learning principles, whereby learners engage responsibly in the design and structure of the learning process (ibid., pp. 221).
- Acknowledging the 'entire' in a holistic process of human development by e.g. including 'Montessori' or 'Waldorf' principles (ibid., pp. 223).
- Considering an entirely different organization of education beyond the mainstream schooling system, such as 'homeschooling' or 'de-schooling' (ibid., p. 224).

3.2.2 Political perspectives in ESD: "Can education transform society?"[80]

Moving from ESD's common ideological ground to the more contested aspects of the debate, the political dimension of ESD[81] is one important point of reference for the critical ESD community (see Huckle, 1991; 1993; Sterling; 1996; Jickling & Spork, 1998; Fien, 2004). As suggested in the previous section 3.1, many critical authors have more recently put the political dimension at the center of their reasoning. They focus, for instance, on the question of citizenship as well as theories of learning, such as transformative learning (e.g. Huckle, 2015; Wals, 2015; Lotz-Sisitka et al., 2015; Sauvé, 2015; Wals & Lenglet, 2016; Wals et al., 2017, p. 26). Practical pedagogical approaches incorporating this more political perspective can be found in "[i]ntentional communities such as ecovillages, transition towns, whole school approaches, local food movements, shared economies, cradle-to-cradle design" (Wals et al., 2017, p. 26). The following paragraphs will give an overview on some of the recent developments in the debate.

Excursus 5: Constructivism, socio-constructivism and critical constructivism

Many of the critical approaches in ESD build on constructivist or socio-constructivist assumptions. Constructivism is a learning theory that assumes that learning is "an active construction of knowledge" (Reusser & Pauli, 2015, p. 913). It is based on the pioneering work of Swiss psychologist Jean Piaget[82] (2000; von Glasersfeld, 1995, p. 54). For

[80] Questions like this were raised by different critical educators. One example is Apple (2013), with his book *Can Education Change Society?*

[81] The term is inspired by a recent contribution of Lucie Sauvé: 'The Political Dimension of Environmental Education: Edge and Vertigo' (Sauvé, 2015).

[82] At the center of Piaget's reasoning is the interaction between internal representations of the learner with incoming information in the form of experiences, new ideas or information from the environment. There are basically two ways to respond to new incoming information: assimilation and accommodation (Piaget, 2005, p. 7). Mental assimilation refers to the incorporation of new information into existing frameworks and patterns of behavior (ibid.). There is no need to modify the learner's internal representations because the information fits the existing framework. If cognitive conflicts provoke failures in assimilation and the information conflicts with the existing structure, no passive submission of the information happens, and accommodation occurs instead. This is when the internal representations are reframed and modified (ibid.), and when learning happens.

constructivists, a person's reality is constituted while being constantly under construction - knowledge is never "complete" but rather in a constant and dynamic flow of cumulative conversion and reconstruction (see Reusser, 2006, p. 154).

Constructivism is not a homogenous field but encompasses different schools of thought. In addition to radical constructivism, which directly builds on Piaget's reasoning and emphasizes the solo-cognitive process (e.g. von Glasersfeld, 1995)[83], *social constructivism* (e.g. Berger & Luckmann, 1966[84]; Vygotski, 1978) acknowledges that learning is rooted in social interactions (see Reusser, 2006, p. 155). According to Lev Vygotsky's sociocultural theory, outlined in *Mind in Society* (1978), "learning and enculturation […] are embedded in a society" (Reusser & Pauli, 2015, p. 913).

Learning is not only embedded in a society, however, but it also always takes place in a specific context, especially a social context. This is known as situated and shared cognition (e.g. Haraway, 1988; Brown et al., 1989; Lave, 1991; Lave & Wenger, 1991). Learning in that regard happens in a 'community of practice', "not as a process of socially shared cognition that results in the end in the internalization of knowledge by individuals, but as a process of becoming a member of a sustained community of practice" (Lave, 1991, p. 65).

The community of critical educators often works with *critical constructivism.* Here, "[k]nowledge is a social construction deeply rooted in a nexus of power relations. When critical theorists claim that knowledge is socially constructed, they mean that it is the product of agreement or consent between individuals who live in particular junctures in time" (McLaren, 2017, p. 58). According to critical constructivists, learners are not only able to analyze the world around them but are also capable of effecting change (see Goodman, 2008, p. 29).

Constructivist approaches in ESD

Social constructivism (see excursus 5) is widely accepted within the ESD community. The ESD community often bases its work on reasoning informed by social constructivism and situated and shared cognition (see e.g. Jickling & Wals, 2008; de Haan & Rülcker, 2009, p. 14), forms that make collaborative solutions necessary. For instance, in the context of transformative adult education and ESD, Singer-Brodowski (2016) drew on empirical evidence to suggest that participation in communities of practice in applied sustainability projects can lead to social-cultural transformation processes on the micro-level (Singer-Brodowski, 2016, p. 227).

Their works often make reference to Antonio Gramsci (e.g. 1929-1935/qtd. in Hoare & Smith 1992) and Paolo Freire (1972). While Gramsci is often referred to in the context of hegemonies, Freire is best known for his insights into the nature of oppression[85]. In his best-known work, *Pedagogy of the*

[83] 'Radical' constructivism is also called the '(neo-)Piagetian' perspective (see Reusser & Pauli, 2015, p. 914). This perspective builds directly on Piaget's genetic epistemology (e.g. von Glasersfeld, 1995). It aims to explain how the construction of meaning happens 'within' one individual in a 'solo-cognitive processes' (see Reusser & Pauli, 2015).

[84] Berger and Luckmann formulated their approach to constructivism in *The Social Construction of Reality* (1966). Like many points of reference in this study, they build on Marx' distinction of 'base and superstructure' (Berger & Luckmann, 1966, p. 17).

[85] He worked with Brazilian workers and assumed that the dehumanization of people leads to a basic division into the oppressors on the one hand (such as political and military elites), and into the oppressed on the other hand (such as farmers and workers).

Oppressed (Freire, 1972), the term of '*conscientizacão*'[86] (critical consciousness, Freire, 1972; 101) is introduced. Like Gramsci, Freire sees the public consciousness as being permeated by ideology and oppressive, hegemonic structures due to the contradictory participation of individuals in their own 'oppression' by internalizing and reproducing the imaginaries of their 'oppressors' (see Mayo, 2015, p. 117). According to Freire, a problem of standard education is that it applies 'banking methods' of educating that are, in part, reproductive mechanisms of oppression. In this model, knowledge is simply 'deposited' into students via transmissive[87] education (Freire, 1972, pp. 73).

Unlearning and 'liberation' in ESD

Many years after his first explorations into paradigm change (see below), Sterling argued that, as a necessary response to the 'deeply changing reality' of 'our Anthropocene times' (Sterling, 2017, p. 39), transitions in education should focus on the "need for unlearning, re-learning, and new learning" (Sterling, 2017, p. 37). Even earlier, Wals suggested that people should not be educated *for* sustainability but we should rather learn "our way out of unsustainability" (Wals, 2012, p. 628).

If ESD is to be considered not only party to and reproductive of the 'hegemonic relations' criticized by both critical ESD and critical educators, but also a potential means of contesting and challenging such relations (see Mayo, 2015, p. 135), the question remains: How could ESD foster counter-hegemonic learning processes? And what might such processes look like?

Using the term 'unlearning unsustainability', Wals argues that people can actually acquire sustainability competencies (Wals, 2010, p. 24). He suggests that, to 'learn the way out', emancipatory approaches opposing the mainstream instrumental ESD approach should be emphasized (see section 3.1, ibid., pp. 628). One specific suggestion for how this 'unlearning' could look like in the context of degrowth was made by Prádanos (2015) and is introduced in the following section 3.3., which will cover the explicit links between degrowth and ESD in detail.

Freire contends that an educational system that places 'critical consciousness' at its center, encouraging learners' critical reflection of the mechanisms of collective oppression and active political involvement, leads to emancipation (Freire, 1972, pp. 73). The teacher opens up a dialogical and horizontal process with the students, "who in turn while being taught also teach" (ibid., p. 67).

[86] "Conscientizacao is the deepening of the attitude of awareness characteristic of all emergence" (Freire, 1972, p. 101).
[87] see section 3.1

According to Freire, a "problem-posing education" (ibid., p. 66) (such as that promoted by the whole ESD community)[88] based on the interaction of reflection and action, could lead to *liberation*:

> *"Liberation is a praxis: the action and reflection of men and women upon their world in order to transform it. Those truly committed to the cause of liberation can accept neither the mechanistic concept of consciousness as an empty vessel to be filled, nor the use of banking methods of domination (propaganda, slogans — deposits) in the name of liberation."*
> *(ibid.)*

According to Gallagher (2008), educational approaches to effecting change in society include developing critical literacy of predominant ways of thinking; intertextual reading, which prompts the examination of texts for their underlying assumptions while acknowledging that they are never neutral; and encouraging learners to question the educational process and context, as well as their positionality within it, instead of just answering questions posed by a teacher (ibid., pp. 253).

Some of the approaches used in critical constructivist education might also be applied in ESD in order to "challenge the dominant discourse" (Gallagher, 2008, p. 253). Such approaches are well-suited for the tasks Selby suggests will be crucial in critical ESD's challenging the idea of continuous economic growth:

- Explicitly contest economic growth and neo-liberalism (Selby, 2015, p. 27), including its dominant assumptions and myths (ibid., p. 32).
- Challenge the assumptions that come along with 'weak' sustainability and evaluate whether they align with a shift away from the idea of growth (ibid., p. 27).
- Leaving simple "consumer awareness education" (ibid., p. 28) behind and instead moving towards the structural causes of unsustainability.
- Moving from an exploitation and dominance of nature towards an embedded human-nature relationship (ibid., pp. 35).
- Focusing on regional economies and participatory democracy (ibid., p. 37).

[88] Problem-based learning (PBL) was initially developed for medical schools (Barrows, 1986). It gained broad acceptance in the ESD community and was integrated in many conceptual approaches to pedagogy (see previous section). Savery (2006) builds on the pioneering work of Barrows to define PBL as "an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem" (Savery, 2006, p. 12). There are some critical fundamentals that determine the process of PBL, they include, for instance, that students need to be in self-directed control of their learning; that the 'problem' is complex and challenging and located in the real world; that the process is transdisciplinary; that the learning is collaborative; and the learning outcomes actually re-informs the problem-solution itself (ibid., pp. 12). Thomas (2009) has argued that problem-based learning is one suitable component for the development of critical thinking and reflective abilities in ESD because it enables the 'how' instead of the 'what' to think (Thomas, 2009, p. 245).

- Including aspects of 'deep' socio-ecological transformations instead of shallow transformations - "wind farms and green consumerism are certainly not enough" (ibid.).

Critical ESD scholar Huckle suggests that ESD should focus on empowering learners to 'be critical', which he argues ought to be the major goal of education (Huckle, 2017a, p. 72). For Huckle, becoming "critical" means always considering the ways in which knowledge and content are embedded in belief systems, ideologies and power structures. The primary goal of thinking in this manner is social justice and the "transform[ation of] inequitable, undemocratic, or oppressive institutions" (ibid.).

Education that fosters genuine critical thinking should be upfront in the way that it "address[es] the question of whether the world can change materially, socially, mentally and politically to confront capitalism's perpetuation of endless compound growth" (Huckle, 2012a, p. 41). By doing so, it should draw on the social learning processes ("praxis, critical pedagogy or critical action research") developed within social movements concerned with the impacts of economic growth, free trade, and inequality.

Transformative learning & 'Bildung' as a transformative process

In most cases of this thesis, the word 'transformation' refers to socio-ecological transformations. There is, however, another understanding that refers to 'mental' transformations as in the following two conceptions.

Both the processes of transformative learning and '*Bildung*' as a transformative process (*'Theorie transformatorischer Bildungsprozesse'*, Koller, 2017) have been points of reference for the critical ESD community in recent years (e.g. Wals, 2012; Lotz-Sisitka et al., 2015; Kosler, 2016; Singer-Brodowski, 2016). These two transformative educational traditions were in many cases geographically and intellectually separate for a long time or ran parallel without significant interaction (see Nohl, 2016, p. 164; Fuhr et al., 2017, pp. x).

Transformative learning theory is deeply rooted in the Anglophone, especially North American, context (e.g. Sterling, 2011; Mezirow, 2000; Brookfield, 2000; O'Sullivan et al., 2002; Cranton & Taylor, 2012. 'Bildung as a transformative process', by contrast, was developed within the German-speaking educational discourse (e.g. Marotzki, 1990; Koller, 2012; Peukert, 2015; Nohl, 2016)[89]. Both traditions build on socio-constructivist assumptions (see Cranton & Taylor, 2012, p. 5), especially with regard to situated learning theories (e.g. Brown et al., 1989; Lave, 1991; Lave & Wenger, 1991).

[89] Recently, authors from both discourses have started to explore their mutual and differing lines of thought (e.g. Nohl, 2016; 2017; Koller, 2016; 2017; Laros et al., 2017) and how they could also "learn from each other by looking at their differences" (Fuhr et al., 2017, p. xiii).

Transformative learning has been pioneered by Jack Mezirow (1990; 2000). In his definition,

> *"[t]ransformative learning refers to the process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of minds, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action. Transformative learning involves participation in constructive discourses to use the experience of others to assess reasons justifying these assumptions, and making an action decision based on the resulting insight."*
> *(Mezirow, 2000, pp. 7)*

Mezirow uses the term "meaning perspectives" as the analytic unit. These are comprised of meaning schemes, which contain beliefs, attitudes and emotions[90] or frames of reference (see Mezirow, 2000, p. 7). Furthermore, as the above quotation suggests, 'mental transformations' are considered a *progressive* learning process. Mezirow originally envisaged ten key steps for this progressive learning process:

1. "A disorienting dilemma
2. Self-examination with feelings of fear, anger, guilt, or shame
3. A critical assessment of assumptions
4. Recognition that one's discontent and the process of transformation are shared
5. Exploration of options for new roles, relationships, and action
6. Planning a course of action
7. Acquiring knowledge and skills for implementing one's plan
8. Provisional trying of new roles
9. Building competence and self-confidence new roles and relationships
10. A reintegration into one's life on the basis of conditions dictated by one's new perspective" (ibid., p. 22).

In summary, a transformative learning experience encompasses fluid phases (see ibid.) between reflection (e.g. step 1-5) and action (e.g. step 5-10).

Central to the learning process are 'reflective discourses' (see ibid., p. 10), "devoted to searching for a common understanding and assessment of the justification of an interpretation or belief" (ibid., p. 11). The transformation of meaning perspectives goes hand in hand with autonomous thinking as a precondition of autonomous action (see Mezirow, 2000, pp. 28). Thus, the

[90] "Transformative learning refers to transforming a problematic frame of reference to make it more dependable in our adult life by generating opinions and interpretations that are more justified. We become critically reflective of those beliefs that become problematic. Beliefs are often inferential, based on repetitive emotional interactions and established outside of our awareness. Frames of reference may be highly individualistic or shared as paradigms. Transformative learning is a way of problem solving by defining a problem or by redefining or reframing the problem. We often become critically reflective of our assumptions or those of others and arrive at a transformative insight, but we need to justify our new perspective through discourse" (Mezirow, 2000, p. 20).

transformation of meaning perspectives may prompt "reflective decisions to act" (ibid., p. 23) which can be immediate or delayed (ibid., p. 24).

Like many other authors, Koller draws on von Humboldt to explain the distinction between learning and *Bildung*, suggesting that *Bildung* "cannot be understood simply as the process of acquiring knowledge or competencies, but rather as a transformation of the subject's relation to the world, to others and to itself" (Koller, 2017, p. 34). Unlike the imagined harmonious development of the self in the neo-humanist tradition, *Bildung* is a "crisis-laden" transformative process (ibid.). Such crises occur when a new social or cultural challenge[91] provokes an inner process that cannot be responded to adequately with the mental resources available (see Koller, 2016, p. 150; 2017, p. 34). In Koller's theory of *'Bildung* as a transformative process', *Bildung* can be seen

> *"(1) as a process of transformation that (2) transforms fundamental figures of the way subjects relate to themselves and the world when (3) grappling with experiences of crises that challenge their present relations to the world and themselves."*
> *(Koller, 2017:34)*

As we have seen, 'transformative learning' and '*Bildung* as a transformative process' both describe how the self relates to the world through the experience of 'meaning perspectives' being constructed between reflective and active processes. Inherent to both is the duality of reflection and action. In both approaches, a phase of reflection precedes a phase of action. This reflection-action focus is also central to many pedagogical approaches in ESD (see chapter 7, e.g. Thomas, 2009; Lange, 2012, p. 198; Künzli David & Bertschy, 2012, p. 42).

Transformative learning and transforming societies

For critical educator Brookfield and others (e.g. O'Sullivan, 2002; 59), critical reflection as a final result of transformative learning is insufficient. It should also lead to social action and the practical organization of socio-economic transformation (Brookfield 2012, p. 141).

When Brookfield (2000) extended Mezirow's work on the social dimension of transformative learning (Mezirow, 1997, p. 10), he examined the cultural conditions and power-relations that influence knowledge and its creation (see Brookfield 2000). He builds on Freire's notion of education as a step towards 'liberation' (Freire, 1972, p. 40) to suggest *ideology critique* as a central category for transformative learning. Similar to critical ESD researcher Huckle's notion of 'becoming critical' (e.g. Huckle, 2017a), transformative

[91] Koller (2017) uses Bourdieu's concept of the habitus. Habitus can be seen as an incorporated social structure and results from the subjectively and collectively framed interactions with social structures (see von Rosenberg, 2017, pp. 300). In the context of transformative processes, the 'habitus' concept offers another analytic approach (ibid.) for understanding how a change and social and cultural reality provokes a change in its dispositions. This opens up potential for further (educational) research. Degrowth authors refer to the concept of 'habitus' as an analytic category, e.g. from Brand and Wissen (2017a) 'imperial mode of living' (see also section 2.3.1).

learning in the sense of ideology critique enables the questioning of "deep-rooted and paradigmatic assumptions" (Brookfield, 2012, p. 133). Ideology[92] critique "focuses on helping people come to an awareness of how capitalism shapes belief systems and assumptions (ideologies) that justify and maintain economic and political inequity" (Brookfield, 2000, p. 128).

In this vein, many critical adult educators have posed the question of whether education can change society (e.g. Freire, 1972; Mayo, 1999; Brookfield, 2000; Allman, 2001; Apple, 2013). Freire maintains that adult education cannot "transform society by itself" (Shor & Freire, 1987, p. 37, cited in Mayo, 1999, p. 92) and that one should be "critically conscious of the limits of education. That is, to know that education is not the lever, not to expect it to make the great social transformation" (Shor & Freire, 1987, p. 130, cited in Brookfield, 2000, p. 144). That is to say, reflection alone cannot effect change unless it is followed by action.

Brookfield builds on Mezirow's distinction between "transforming habits of minds" and "transforming structures" (Mezirow, 2000, p. 19), to suggest that the educational task is "building the confidence and ability to work for collective change - and the broader scale political mobilization needed to force economic change" (Brookfield, 2000, p. 144, building on Mezirow, 1990, p. 210). Thus, reflections become transformative when they foster challenges to hegemony and when they prompt counterhegemonic practices (ibid. 138).

Brookfield contextualizes building counterhegemonic practices with situated cognition (Lave & Wenger, 1991): because our 'life worlds' are marked by the dominant ideology, our cognition can only change when our experiences do. "[C]hanging cognition depends on changing culture and ideology" (Brookfield, 2012, p. 143). Subsequently, only if the capitalist culture and the structures are changed, will the consciousness of people and their cognition change (ibid.).[93]

Transformative learning and paradigm change

Critical educator Paula Allman calls the historical educational topos between the self and the world (outlined in excursus 4) the "educational dialectic of self and society" (Allman 2001, pp. 171). She discusses it in the context of 'revolutionary' social transformation. A transformation of ourselves, Allman argues, also transforms the social relations surrounding us and therefore society at large, and vice versa: "As we transform these relations, then we are also, in a critically and creatively conscious way, reshaping and redefining the type of

[92] Rooted in Critical Theory, Brookfield (2012) argues that implicit interpretations and power structures are formative for the individual (Brookfield, 2012). In Brookfield's (2000) definition, ideologies are "sets of values, beliefs, myths, explanations, and justifications that appear self-evidently true and morally desirable. […]. They legitimize certain political structures and educational practices so that these come to be accepted as representing the normal order of things" (Brookfield, 2000, p. 129).

[93] "[R]eified forms of thought and practice can be changed only if the structures producing and sustaining those phenomena are changed. And if capitalist structures produce and sustain individualized, competitive practices, […], then only a move to cooperative, democratic, socialist structures will serve to instigate a truly transformative change of consciousness"(Brookfield, 2012, p. 143)

people we are" (ibid., p. 181). Such processes should be conducted in a "critically conscious manner" (ibid.), shifting from a reproductive and habituated praxis towards a transformative one. Such educational contexts can be considered in their potential to effect an economic paradigm shift between the transformation of the individual and their social relations.

The emerging educational research on social movements[94] provides insights into such mechanisms. Education can function in different ways in the context of social movements. For instance, claims for better educational conditions can be the topic of a social movement, or social movements such as the degrowth movement can vice versa have a public educating effect. Miethe and Roth suggest that, in line with Allman's idea of the educational dialectic, individual educational processes re-inform the collectivity of the movement and are interconnected with collective educational processes and therefore take part in developing collective identity[95], which is considered as "more than the sum of individual learning" (Miethe & Roth, 2016, p. 24, translated by the author).

Social educational scientist Susanne Maurer suggests that social and political practice result in a simultaneity of individual education and the transformation of the social reality.[96] By interacting with the public sphere, the actors of social movements intervene in the social reality and thus transform both the social circumstances and themselves (see Maurer, 2016, pp. 87). This view finds support in the observations of other critical educators (e.g. Freire, 1972; Allman, 2001),

Some ESD authors point to collective self-organized processes of social movements for systematic change in communities (e.g. Zivkovic, 2017, pp. 173). For Le Grange, such processes are based on networks of different groups within social movements. Their actions can result in multiple means of knowledge production in collective spaces (Le Grange, 2017, pp. 97). Le Grange argues that sustainability should therefore be described 'rhizomatically' instead of 'hierarchically' in order for it to be transformative. While 'rhizomatic' refers literally to a horizontal, networking rootstalk, in the educational process it means that if ESD is understood rhizomatically, it "connects the ideas, tools, and skills of all participants involved (community members,

[94] Social movements have been studied extensively in sociology, political sciences and social psychology, but the educational research on social movements is still an emerging field. However, recently, for instance the biggest and most important German-speaking conference on education in March 2018 was called "movements" (German: *"Bewegungen"*) and strongly included research on education and social movements. (http://www.dgfe2018.de/, *Date of access: 31.05.2019*).

[95] Melucci's approach of the "Collective Identity" (Melucci, 1989; 1995), based on research on social movements in the 1980s. Per definition, "Collective Identity is an interactive and shared definition produced by several individuals […] and concerned with the orientations of action and the field of opportunities and constraints in which the action takes place" (ibid., p. 44). Alberto Melucci's (1989; 1995) work gives an explanation of how a 'collective identity' can occur in informal ways out of a social movement. He suggests it emerges through (1) cognitive definitions of goals, means and fields of action, (2) a network of active relationships and social exchanges between actors/participants and (3) a certain degree of emotional investments to feel like part of a community in form of the 'irrational' part of the collective identity (see Melucci, 1995, pp. 44).

[96] By studying the example of the 'New Feminist Movement', Maurer concludes that all "oppositional social movements" that aim at social transformation processes in a certain way usually point out conflicts that bring up both occasions and challenges for educational processes (Maurer, 2016, p. 87). "Speaking with Foucault or Butler: With the focus on oppositional practices, education becomes a 'counter-concept' but also 'resistance' and 'counter-behavior'" (ibid., translated by the author). This leads to three analytic categories for social movements: (1) The individual dimension (self-education and self-creation), (2) the collective dimension (oppositional collectivity in norms, goals and focus of political action) and (3) the dimension of recognition (knowledge about the configuration and operation modes of the targeted social circumstances) (ibid., p. 88).

academics/teachers, and students) in multiple ways to produce 'new' knowledge in 'new knowledge spaces" (ibid., p. 98).

In a similar vein, critical ESD author Sauvé uses the term 'informal eco-social learning' to describe "a form of unplanned learning that emerges from social interaction of collective action" (Sauvé, 2015, p. 107). Such forms of learning occur for instance in collective ecosocial initiatives such as gardening projects, food sharing networks, etc. Sauvé argues that we should not underestimate the power of social learning when upscaled in "collective action, reacting against projects or public decisions that are invasive or unjust, or developing ecosocial initiatives that contribute to the transformation or improvement of our way of living […] together" (Sauvé, 2017, p. 122). In such socio-constructive forms, 'learning to live together' (UNESCO, 1996, pp. 20) takes place "whilst carrying out a cognitive task, or within a social action project: learning to construct and to mobilize knowledge to transform social and ecological realities as well as to transform oneself, individually and collectively" (Sauvé, 2015, p. 107).

The experience of such transformative learning processes is not always pleasant, however. Critical ESD scholars emphasize the importance of disruptive and discomforting learning experiences (McGregor, 2015, pp. 267), and therefore urge educators to make use of such learning processes intentionally. Thus, many ESD approaches make use of transformative learning theory (see also chapter 7), which enables learners to become critically aware of their underlying or tacit assumptions, assess those assumptions, and then potentially re-interpret them (see Wals, 2012, p. 637). Wals (2012) suggests that this process has the capacity to "unfreeze minds and break […] existing routines and systems" (ibid.).

Lotz-Sisitka et al. (2015) argue for 'transformative, transgressive learning' that focuses on both the public and the personal good (Lotz-Sisitka et al., 2015, p. 78). In this radical conceptualization, the authors expand Mezirow's (1990; 2000) terms of transformative learning (see chapter 4.4) to include social collective action. According to the authors, Mezirow's approach, which focuses on cognitive transformations of individuals, insufficiently addresses "social action or agency, especially collective transformations of human activity" (Lotz-Sisitka et al., 2015, p. 75). They conceptualize learning as follows:

> *"[W]e argue that if we are to fully expand the 'learning modes' needed for responding to and engaging the wicked problems of sustainability, […] there is need for more exploratory, transgressive forms of learning in our institutions. Ultimately these will require […] possibilities for learning that allows for the emergence of agency and lived experience in transformative praxis contexts. Such transformations in pedagogical set-up, must also teleologically suspend disciplines in transgressing taken-for-granted norms, existing ethical*

and epistemological imperialism in society and higher education, and provide possibilities for engaged, lived experience of transformative praxis [...]."
(Lotz-Sisitka et al., 2015, p. 78)

Therefore, transformative, transgressive forms of learning are based on the assumption that learning/education depends on '*transgressing* the norm' (see ibid., p. 75), allowing learners to explore radical system change and contribute to the disruption of the hegemonic morals and norms that work in favor of the status quo (see ibid., p. 76).

The need for paradigmatic changes fostered by ESD has been outlined in section 3.1, which focuses on the points of critique put forth by the critical ESD community. Stephen Sterling (2003; 2011) has written extensively on the role of such paradigmatic changes in the context of learning and sustainability. He connects his reasoning to the work of Gregory Bateson (Sterling, 2003, pp. 33; see also Kosler, 2016, pp. 66).). This thesis will however restrict itself to a brief overview of Sterling's extensive argument. He suggests that, in transformative learning, there are three levels at which learning takes place. The first level is 'normal' learning, in which 'normal' cognition leads to the "[e]ffectiveness/[e]fficiency" of the learner. This can also be labeled as "conformative" learning (Sterling, 2003, pp. 33). The second level is 'meta-cognition', which leads to "[e]xamining and changing assumptions" and can be labeled as "reformative" learning. However, the deepest-seated level – 'epistemic learning' – is that which effects "[p]aradigm change". This can also be labeled as "transformative" learning (ibid., pp. 24).

Most interesting for this study is that Sterling's conception of the levels of learning has a counter-intuitive order-structure, in which each level is dependent on the previous. The first level of learning, or 'normal learning', is easy to access but has little transformative impact on both the individual and organizational scale (see Sterling, 2011, p. 17). Meta-cognition requires 'normal learning' to function, preparing the ground for deeper-seated learning experiences. These must be preceded by meta-cognition because they are "difficult - first to facilitate or design as a learning experience, and second, as a felt experience for the learner" (ibid., p. 25). However, if such processes are enabled, they have the power to be transformative in a paradigmatic sense.

From a practical educational perspective, this connects to insights from sustainability psychology that explain why the level of critique and awareness of 'big problems' often differs from the level of intervention for transformation, which is done only in 'little steps' (see Scott et al., 2016, p. 305). Sustainability psychologists Scott et al. emphasize that the intention to impact on the macro-level through actions taken on the micro-level is in concordance with certain aspects of human psychology and is an important first step on the way towards change (Scott et al. 2016, p. 305). They point out that directly tackling the "big stuff" (ibid.) is rarely done, because, in their explanation the small steps reduce anxiety. One example given by the authors is how small individual actions on

climate change such as reducing one's own CO_2 footprint by consuming differently, such as eating less meat, can contribute at least to a limited extent to the big remaining problem (ibid.). Large-scale thinking is anxiety-inducing, whereas small-scale actions are not. The 'little steps' play an important role in the context of education because they are empowering for individuals as they encourage a sense of personal agency. In a progressive approach, this can subsequently lead to a mainstreaming, when small steps add up. In summary, from a psychological perspective, these 'little steps' are crucial because they increase the level of self-efficacy and can upscale in social regards towards social collective action movements.

They go on, perhaps optimistically, to speculate that "sustainable behaviors will become the default and will be supported by policies, social norms, and infrastructure, hopefully sooner rather than later" (ibid., p. 306). For further steps, they suggest a strategic psychology of creating a "social avalanche for sustainability" (ibid., pp. 308) including purposely planning the upscaling of sustainable projects and the integration of communities and stakeholders.

"Sustainability Citizens"

Wals defines one key aim of ESD as "transformative (social) learning for socio-ecological sustainability" (Wals, 2015, p. 21)[97]. By building on the picture of an emancipated 'educated citizen' (see last section 3.1, Jickling & Wals 2008), Wals emphasized the importance of active *sustainability citizens* who oppose the role of passive inhabitants of the earth that simply learn to cope with and adapt to changes (Wals & Lenglet, 2016, p. 64) and instead "participate in the co-creation of new systems and associated routines" (Wals, 2015, p. 21):

> *"A sustainability citizen is one who is able to interrogate resilient unsustainability and who can participate in the co-creation of new systems and associated routines […]. Clearly this demands more than the ability to adapt to changing circumstances […]. It rather requires the capacity to disrupt and to transgress prevailing, dominant and unquestioned frameworks and systems that predetermine and structure social and economic behaviour, and that, somewhat ironically, have proven to be highly resilient themselves. [...] By stressing disruptive capacity building and transgressive learning (see also Lotz-Sisitka et al., 2015) the focus shifts away from learning to cope with the negative and disempowering effects of the current hegemonic ways of 'producing', 'consuming' and 'living' to addressing the root causes thereof and to the quest for morally defensible, ethical and meaningful lives."*
>
> *(Wals, 2015, p. 30)*

Wals and Lenglet suggest that the notion of 'sustainability citizens' is about more than learning about 'matters of fact' but rather about making these matters

[97] Håkansson et al. (2017) systematically reconstructed different progressive narratives of ESD in regards to the phenomenon of conflict within learning processes. In their analysis, they reconstructed three different narratives: (1) 'Socially critical approach', (2) 'social learning approach' and (3) 'radical democratic approach'. Central figures in the 'socially critical discourse' include John Huckle and in the 'social learning discourse' Arjen Wals. Håkansson et al. use 'radical democratic' to describe their own approach (Håkansson et al., 2017, p. 5).

a subject of public concern and deliberation that then leads to collaborative learning and, finally, collective action (Wals & Lenglet, 2016, p. 52). Such sustainability citizens are actively involved in shaping the processes of decision-making in their political environment and local communities.

In this context, it is also important to highlight that, by stressing active political categories such as 'citizenship', ESD could strengthen its critical profile by opposing the large number of de-politicizing approaches and contributions that are restricted to exploring how consumption and lifestyles can be 'greener', and how learners – cast in the role of passive consumers – must 'cope with' and 'adapt to' unsustainability (see Wals & Lenglet, 2016, p. 64).

3.2.3 Synthesis: Critical ESD and its suggestions for *transformation*

This second section of the third chapter has explored the transformative potential of ESD in broad theoretical terms. The beginning of the section has pointed out that there are certain common assumptions shared by the entire ESD community, for instance, that ESD encompasses certain constituent parts out of which chapter 5-7 will explore three in more theoretical and empirical detail: knowledge elements, competency components and pedagogical approaches.

Focusing on the more critical points of the debate, the critical community is busily developing "counter-communications" (McGregor, 2015). Many critical authors build on Mezirow's conception of transformative learning to move towards forms of learning that could not only address the learners as individuals but also their social reality. Recently, the conceptions encompass "transformative, transgressive learning" (Lotz-Sisitka et al., 2015) and "sustainability citizens" (Wals, 2015; Wals & Lenglet, 2016).

Regardless of whether or not one prefers to make use of terms such as 'sustainability *citizens'*, the focus on the political dimension in ESD can be understood in the way that it conceptualizes adults in their *active* role as participants in a self-transforming society and economy rather than as passive inhabitants or consumers – which is also valid for education in social movements (such as the degrowth movement). All integrated discourses in this study – the degrowth discourse, critical pedagogy and also some parts of the critical ESD community – emphasize the role of practical involvement in counter-hegemonic practices for challenging dominant power structures (Huckle, 2017) and 'transgressing' prevailing norms (Lotz-Sisitka et al., 2015) in order to initiate a paradigm change in education and societies at large (Sterling, 1996; 2010). This transformation of the social reality happens parallel to transformative learning processes of the individual.

3.3 Explicit links between ESD/education and degrowth

The previous two sections of this chapter explored some of the many critical perspectives that relate to a critique of economic growth and neoliberalism in ESD. The body of literature boasts a wealth of contributions linking ESD with the concepts of 'economic growth', 'Critical Theory', 'neoliberalism', 'capitalism', 'paradigm change', and 'strong sustainability' reveal the remarkable body of progressive or critical research in the ESD community. However, perspectives of *degrowth* remain grossly underrepresented, even in the critical ESD community. Search attempts in scientific search engines under the keywords 'degrowth', 'education' and ESD (including the multiple related terminologies) lead to a limited number of contributions that directly use these keywords to frame their research (e.g. Díez Gutiérrez, 2010; Prádanos, 2015; Berryman & Sauvé, 2016; Getzin & Singer-Brodowski, 2016; Rieckmann, 2017).

Berryman and Sauvé argue that in the context of ESD, degrowth offers "another perspective on the economy that more seriously challenges traditional economical doctrines focusing on growth and development" (Berryman & Sauvé, 2016, p. 110). They suggest that degrowth can help us understand and deconstruct the unexamined assumptions in the dominant economic and ESD discourses. However, an explicit theoretical link between ESD and the degrowth debate is still in its infancy.

Approaches from the other direction – coming from degrowth and exploring education – are also few and far between. However, the topic seems to be drawing increasing attention from both sides[98]. Within the academic degrowth discourse as well as in the social movement of degrowth, the role of education, learning and knowledge is emphasized by a few authors (e.g. Prádanos, 2015; 2017), especially in the context of social action (Brand, 2017, p. 35). Important *practical* educational contributions include teaching materials on growth critical education[99], workshops and training sessions for educational multipliers and growthcritical workshops and seminar weeks (Konzeptwerk Neue Ökonomie e.V. & FairBindung e.V., e.g. the 'Theater Workshop' which was studied in the empirical part of this study).

In the following, three academic contributions linking education and degrowth will be suggested that have strong similarities in their basic assumptions and theoretical points of reference.

Pedagogy of degrowth

While many degrowth authors simply point out the need for further research, some of these non-educational researchers with a special interest in education,

[98] This can also be observed along the slow but steadily rising number of educational contributions to the biannual degrowth conferences (e.g. https://malmo.degrowth.org, *Date of access: 31.05.2019*).

[99] See the methods sourcebook 'Beyond Growth' from two German growth critical associations: ‚Konzeptwerk Neue Ökonomie e.V.' and ‚FairBindung e.V.': https://www.endlich-wachstum.de/kapitel/materials-in-english/, *Date of access: 31.05.2019*.

such as Prádanos (2015), have developed transdisciplinary ideas for pedagogy in the context of degrowth and thus forged connections with educational discourse. Based on a session at a summer school on degrowth and his own experiences in teaching Hispanic studies, degrowth scholar Prádanos (2015) has developed a "Pedagogy of Degrowth". Prádanos suggests some strategies, including:

1. Unlearning by reversed critical pedagogy
2. A meta-pedagogical critique of existing teaching materials and contents within the curriculum and
3. The incorporation of indigenous pedagogies from the Andes (Prádanos, 2015, p. 159).

Prádanos' proposals are interesting in terms of positioning the role of education within the process of societal transformation:

> *"If education is going to make a positive contribution in our age of economic reductionism, social inequality, and ecological collapse, it needs to turn students (and educators!) into complex systems thinkers able to unlearn the destructive inertias ingrained into our educational institutions and cultures. Our real prosperity depends on it" (Prádanos, 2017).*

Unlearning the "destructive inertias ingrained into our educational institutions and cultures" (ibid.) is crucial to Prádanos' approach, and the importance of 'unlearning' was already suggested in the context of critical ESD. But what might such unlearning look like?

Prádanos suggests guiding students towards unlearning "ingrained commonplaces about economic growth, development or progress as well as the epistemological tendencies to disconnect social and natural sciences, humans and non-humans, economy and ecology" (Prádanos, 2015, p. 158). He builds on critical pedagogy for his teaching strategies in higher education. He suggests that most courses of higher education mainly address relatively privileged students. He suggests that they are in fact their own 'oppressors', and that they must unlearn the beliefs and patterns of behavior that are harmful for the 'oppressed' "living systems of the planet and themselves" (ibid, p. 160).

Examples of his teaching aims include showing how GDP growth can have harmful consequences for the local environment and making them aware of the 'growth is good' myth in order to awaken their critical consciousness.

Transformative learning in a degrowth society

Getzin and Singer-Brodowski (2016) relate their work on degrowth and transformative learning directly to the ESD discourse, using the theoretical distinction of instrumental (in the sense of 'instrumentalizing') 'ESD 1' and critical-emancipatory 'ESD 2' proposed by Vare and Scott (2007). They point out the

vast potential of transformative learning informed by degrowth, coming to the conclusion that such critical-emancipatory 'education in the context of degrowth' can be fostered when undertaken using the following practical approaches:

1. Situated and action-oriented learning settings (problem-based learning)
2. Intense phases of reflection
3. A re-definition of the special role of the educator/teacher and the relationship between learners and teachers/educators
4. A re-consideration and critique of the role of educational institutions as reproductive units of the dominant socio-imaginary of economic growth (Getzin & Singer-Brodowski, 2016, pp. 43).

They problematize a possible positioning of 'education in the context of degrowth' within the ESD discourse or outside the discourse as a separate concept. They emphasize that there are strategic reasons for positioning 'education in the context degrowth' *outside* of ESD. If 'education in the context of degrowth' remains outside ESD, the role of ESD could be to continue anchoring socio-ecological reasoning in broad mainstream educational policies without being too uncomfortable to decision-makers by challenging economic growth and neoliberalism. Education in the context of degrowth, on the other hand, could then continue as a critical niche project. From this position it could continue to provide inspiration from the 'critical corner' and point out the blind spots within the ESD discourse (ibid., p. 44). The relationship between education in the context of degrowth and ESD is discussed again in the context of the results of this study (see chapter 8).

ESD, buen vivir and post-growth

Rieckmann (2017) has worked on the relationship of ESD, buen vivir and post-growth. Like the concept paper that was used to help prepare the expert workshop in the empirical part of this study (Getzin, 2016, unpublished, see chapter 4), Rieckmann (2017) also makes use of Muraca's distinction of the three dimensions of transformation (Muraca, 2015, p. 205, see also section 2.4) when considering education in the context of Buen Vivir (see section 2.2.4) and the German-speaking discourse on post-growth.

In regards to the *structural and institutional dimension*, Rieckmann (2017) argues that systemic and structural barriers to unsustainability and their cultural influences cannot be overcome through individual behavioral adjustments. Referring to Wals' notion of 'sustainability citizens' (Wals, 2015, p. 30), Rieckmann suggests that such a conceptualization could enable learners to question existing structures, to think laterally and thereby contribute to structural socio-ecological transformations (ibid., pp. 153).

He also builds on the analytical distinction of 'ESD 1' and 'ESD 2', arguing that, in the dimension of *individual and collective practices* (Muraca, 2015, p. 205), the emancipatory approach of ESD 2 could help learners to develop capacities and competencies that enable people to contribute to such socio-ecological transformations. Whereas Rieckmann considers this specifically in the context of sustainability citizenship and its virtues (Rieckmann, 2017, pp. 150), this thesis argues that this should be considered on a broader scale.

He argues that in the dimension of the *social imaginary* (Muraca, 2015, p. 205), ESD could help learners to investigate the fundamental value orientation of a society and contribute to their own values 'clarification'. Informed by buen vivir, this could lead to a reconfiguration of the human-nature relationship and collectivity in terms of enabling more biocentric values (Rieckmann, 2017, pp. 152).

3.3.1 Synthesis: Theoretical overlaps of the contributions

This section introduced existing links between education and degrowth. All three analyzed contributions display interesting commonalities and are valuable in their consideration of ESD from the perspective of degrowth.

The first common thread between all three is that each of their educational concepts refer to a 'strong' conception of SD and acknowledge the limits to growth as a starting point for their considerations (Prádanos, 2015; Getzin & Singer-Brodowski, 2016; Rieckmann, 2017). Learning is conceptualized as a critical-emancipatory process that uncovers, assesses and questions prevailing norms and conceptions (Prádanos, 2015; Getzin & Singer-Brodowski, 2016; Rieckmann, 2017).

Another commonality between these three contributions in this emerging field of research makes extensive use of the concept of the social imaginary. This indicates that the social imaginary (with different emphases) seems to be central to educational considerations in the context of degrowth. Both Prádanos and Getzin and Singer-Brodowski build on Castoriadis' (1987) and Latouche's (2015) notion of the social imaginary, suggesting that education could contribute to *decolonizing* the social imaginary with concrete proposals of transformative pedagogies (Prádanos, 2015, p. 160; Getzin & Singer-Brodowski, 2016, p. 44).

Getzin (2016 - unpublished) and Rieckmann (2017) both consider how the three dimensions of transformation as suggested by Muraca (2015) could be fruitful for educational considerations in the context of degrowth/post-growth. Rieckmann draws on the concept of the social imaginary arguing that learners could use this dimension for a detailed values identification and clarification (Rieckmann, 2017, pp. 152).

The three publications as introduced in this section have different foci: whereas Prádanos (2015) emphasizes the role of 'unlearning', Rieckmann

(2017) focuses on the concept of 'citizenship', and Getzin and Singer-Brodowski (2016) highlight the importance and potential of transformative learning processes. Prádanos (2015) and Rieckmann (2017) also both build on contributions of buen vivir, while Getzin and Singer-Brodowski (2016) and Rieckmann (2017) share the analytical distinction between instrumental and critical-emancipatory approaches to ESD.

Furthermore, Getzin and Singer-Brodowski (2016) consider the positioning of degrowth in relation to ESD. At the end of this study, this underlying debate will be reconsidered.

3.4 Conclusions to critical ESD and critical pedagogy

This chapter explored the extent to which ESD has been informed by the degrowth debate so far (RQ2). In three sections, it introduced critical ESD and its points of critique (section 3.1), its suggestions for socio-ecological transformations (3.2) and the very small field of emerging research that explicitly contextualizes ESD/education with degrowth (3.3). In conclusion to the question of this chapter, only the examples given in section 3.3 indicate the limited extent to which ESD has been *explicitly* informed by the degrowth debate thus far. Degrowth's *implicit* influence upon and relationship to critical ESD has been made transparent throughout sections 3.1 and 3.2.

However, in the following, there are some valuable observations that prepare the ground for a later consideration of the main research question of this thesis, which will take place in section 8.2. These are as follows:

1. Mainstream conceptions of ESD are unavoidably shaped by neoliberalism and economic growth.

   The re-consideration of ESD from this perspective is important because ESD in its current mainstream application favors economic growth instead of contributing actively to sustainability. The contradictions caused by informal learning processes can be understood as resulting from the influence of economic logic on the formal education sector. Such informal processes typically support learners' continual adoption of this problematic logic. ESD approaches that ignore this interrelation can be seen as 'accomplices' (Selby, 2010) to unsustainability.

2. Critical ESD has close, but implicit, ties to the tradition of critical pedagogy. ESD could be best informed by degrowth at the nexus of these two discourses, while remaining oriented towards strong sustainability and 'radical' transformative perspectives.

   Both critical ESD and critical pedagogy suggest that, in order to resolve the contradictions created by the incorporation of ESD into neoliberal education agendas and thus contribute meaningfully to 'strong' sustainability, ESD would need to focus on developing mental frameworks that actually combat alienation. Critical pedagogy and critical ESD overlap in their perspectives on sustainability and transformation – an outlook shared by the degrowth discourse.

3. In their transformative suggestions, both the critical and the 'mainstream' communities of ESD agree that formal educational institutions need to be re-designed with regard to ESD's constituent parts, such as knowledge elements, competency components and pedagogical approaches.

The suggestions of the ESD community include aspects of a fundamental re-structuring of education using a whole-institution approach (éducation21, 2016; UNESCO, 2017a) as well as 'uncomfortable re-configurations' (Selby, 2015) of educational institutions and processes.

4. The critical ESD community and critical pedagogy assume that education can transform society by building on certain educational strategies, such as developing in learners the critical capacities required to reflect upon and question the dominant norms and ideologies of unsustainability, or else theories, such as transformative learning and situated cognition.

   Critical ESD authors often focus on transformative learning theory because it enables a critical clarification of learners' underlying assumptions and because it may also lead to an altered praxis that can change prevailing routines (Wals, 2012, p. 637). Brookfield's (2000; 2012) application of transformative learning and ideology critique (Brookfield, 2012, p. 128) can be used to challenge dominant norms and values. Critical reflection and transformative action (Freire, 1972) are, taken together, considered suitable means for a practical re-organization of socio-economic transformation (see Brookfield, 2012). The exploration in this chapter suggested that, in a process of emancipation as part of a larger participatory and transformative process (Vare & Scott, 2007; Jickling & Wals, 2008), learners can be active agents in socio-ecological transformation. In doing so, they transform themselves as a result of the learning process, while social relations and the culture of which they are part are also transformed (Allman, 2001; Brookfield, 2012).

   Sterling's work (2003; 2011) on the different levels of learning and their relationship to paradigmatic change is a foundational contribution to critical transformative ESD, which can explain how the individual process of transformative learning relates to broader social transformations.

5. The few contributions that explicitly link degrowth and ESD/education (section 3.3) emphasize the role of the social imaginary in learning processes and focus on 'unlearning' the received ideas surrounding economic growth. However, at present, such contributions lack deeper theoretical considerations with degrowth ideas.

   The degrowth perspective appears to be valuable for ESD in a variety of ways. It could be useful not only because of the access it provides to the debate via ecological economics but also due to certain crucial aspects of its theoretical framework that ESD currently lacks, in particular, concepts such as paradigm, ideology and hegemony of growth. Furthermore, its transformative proposals open up space for considering how a focus on the political dimension can be practically applied in the learning process.

4 Research gap and study design

The following chapter introduces the approach for the empirical part of this thesis. Building on the theoretical considerations of both the degrowth debate and critical ESD, the research gap will be described (section 4.1). Subsequently, the remaining research questions of this study will be introduced in detail (4.2). The study design will then be described, including explanations of the display of the data (4.3). Then, the methods of inquiry and analysis will be outlined (4.4), before giving an explanation of how the empirical study aims to meet the quality criteria of this study (4.5).

4.1 Research gap

The previous chapters paved the way for the research gap of this thesis, by demonstrating the lack of elaborate or detailed links between ESD and degrowth so far. This lack comes as no surprise, considering the topic of degrowth (in the narrower sense) is barely a decade old. Furthermore, ESD itself is also still very much in the process of its own rapid development, although the discourse has been around for thirty years or more.

The criticism of economic growth in the broader sense and of both capitalism and neoliberalism has long been part of the critical ESD debate. The critical ESD community identifies the focus on economic growth in ESD as one of the major barriers to ESD bringing about sustainability. However, although much critical work has already been done by the critical ESD community – work upon which this thesis intends to build – and despite the shared paradigmatic assumptions and theoretical roots of the two discourses, there are still many elements yet to be considered regarding the links between ESD and degrowth. That is to say, although the research gap is not as large as might have been expected, there is still much work to be done to close it.

The degrowth debate certainly has many points of theoretical overlap with the critical arm of ESD. Both assume a 'strong' sustainability position, both are explicitly growth-critical, and both discourses aim to be not only critical, but also transformative. Degrowth, however, possesses several key characteristics that distinguish it from critical ESD. In terms of its aim to be transformative, degrowth's transformations are explicitly intended to take place on several levels, or dimensions, simultaneously: the structural and institutional dimension, the dimension of individual and collective practices, and the dimension of the social imaginary (Muraca, 2015, my translation). Degrowth also holds that such socio-ecological transformations should be informed by sustained, structural criticism of economic growth on the levels of paradigm, ideology and hegemony. Finally, degrowth is also distinguishable from critical ESD due to its emphasis on the decolonization of the social imaginary.

Degrowth is explicitly political, and therefore controversial from an educational perspective. While in the degrowth debate contributions to socio-ecological transformations can be defined without issue as a 'political program', any educational endeavor with a specific political goal is at risk of instrumentalizing its learners. In order to avoid doing so, critical educators prefer emancipatory conceptions of education (see e.g. Vare & Scott, 2007; Jickling & Wals, 2008). Both critical adult educators and critical ESD scholars suggest how, for instance, critical consciousness (e.g. Freire, 1972, Brookfield, 2000; Lotz-Sisitka et al., 2015) and unlearning unsustainability (e.g. Wals, 2012; Sterling, 2017) can contribute to paradigmatic changes (Sterling, 2003; 2011). These approaches operate on the assumption that, through fostering critical-emancipatory educational opportunities, education can contribute to processes of both individual and societal transformations by empowering, rather than instrumentalizing, its learners.

Nevertheless, an explicit and detailed theoretical link between degrowth and ESD is still lacking. Considering the remarkable number of growth-critical contributions found in ESD, academic literature and research linking degrowth with education in general and ESD in particular are still rare (e.g. Prádanos, 2015; Berryman & Sauvé, 2016; Getzin & Singer-Brodowski, 2016; Rieckmann, 2017). There are, it should be noted, no contributions that link their degrowth-related considerations to ESD with *empirical* evidence. This weak link can be clearly identified as a research gap. So, although a bridge between the two disciplines is being tentatively constructed, the main research question remains: What can ESD learn from the degrowth debate?

However, because so much critical ESD work has been done already on broader theoretical aspects of growth criticism, this study focuses empirically on three more specific, and crucial, constituent parts of ESD as suggested in section 3.2.1: knowledge elements, competency components and pedagogical approaches. The ESD discourse does not, as yet, consider these with regard to degrowth to any significant degree. Thus, the goal of this thesis is to investigate these three constituent parts of ESD from the perspective of degrowth, in the hope of identifying elements of the latter that may be useful for ESD.

4.2 Remaining research questions

In the introduction of this study, a brief overview of all the research questions was given. Two of the questions have already been addressed. Chapter 2 outlined what the degrowth debate is about (RQ1), and chapter 3 explored the extent to which ESD has been informed by degrowth thus far (RQ2).

As was mentioned in the explanation of the research gap (4.1) above and introduced in section 3.2.1, the focus of the empirical investigation of this thesis will be on three dimensions of the ESD debate that are – without being exhaustive – of overall importance to the educational conception of ESD: knowledge elements, competency components and pedagogical approaches. Degrowth has only been considered in ESD to a very limited extent – and almost exclusively in the form of broader theoretical considerations (see section 3.3). Pedagogical approaches have as yet been considered only unsystematically, and knowledge and competencies hardly at all. Therefore, the remaining questions for the chapters to follow are:

RQ3 Which knowledge elements from the degrowth-informed educational practice should be integrated into ESD? → Chapter 5

RQ4 Which competency components from the degrowth-informed educational practice should be integrated into ESD? → Chapter 6

RQ5 Which pedagogical approaches from the degrowth-informed educational practice should be integrated into ESD? → Chapter 7

The three abovementioned research questions refer to the 'degrowth-informed educational practice'. This implies that the respective educational practice does not exclusively relate to degrowth – it is not 'from' degrowth. Rather, it is implicitly or explicitly informed by the degrowth debate and by expertise or practical experience in the field of degrowth. This goes for both research units which will be presented in the following section.

The answer to the main research question – what ESD can learn from the degrowth debate – will be considered in light of the five research questions posed in the above chapters in the overall discussion of the thesis.

4.3 Study design

The empirical part of this thesis takes an 'exploratory'[100] qualitative approach. The thesis focuses primarily on critical (non-formal) adult education. The reasons for doing so were outlined in chapter 3.[101] In the empirical process, two research units were taken into account. This focus on two research units enables the triangulation of the codes (see section 4.4.1) from more than one data source, which ensures the credibility of the data.

The first research unit encompasses 17 case studies, with two 'problem-centered, semi-structured' interviews per person (34 in total). Each case study concerns itself with one participant from one of four different, mainly non-formal educational programs on degrowth, socio-ecological transformations or ESD. The interviews focused on knowledge elements, competency components and pedagogical approaches. The case studies provide the perspectives of individuals from within the learning process. Details for the sampling strategy will be given in the following section.

The second research unit consists of one expert workshop with 11 experts in the theory and/or practice of degrowth and/or ESD. In this workshop, five focus groups were conducted. The focus groups discussed primarily knowledge elements, competency components and pedagogical approaches. These experts provide a range of 'professional' perspectives on the learning process. Details for the sampling strategy will be given in next section.

These two research units provide the data body of the study. Fig. 8 below indicates the general structure of the thesis. Chapters 2 and 3 delved into the theories foundational to this thesis as well as the state of the existing research. This next part of the thesis introduces the 'practical' perspective of the two research units. The goal is to then return to the theories in the overall discussion to review them in light of the empirical findings.

This structure will be mirrored in each of chapters 5-7, but on the micro-level of either knowledge elements, competency components or pedagogical approaches.

[100] 'Exploratory' here is understood as a general perspective on the research process in social sciences. This perspective suggests that "[q]ualitative studies call for continuous refocusing and redrawing of study parameters during fieldwork, but some initial selection still is required" (Miles et al., 2014, p. 30).

[101] The study design builds on the different critical communities that are part of the thesis, such as degrowth, critical ESD and critical pedagogy and the assumption that *formal* education is "typically less free to innovate than non-formal [education]" (Sterling, 1996, p. 21) and that much formal education is contradictory to sustainability due to the routines and system it is built upon, and which it also reproduces.

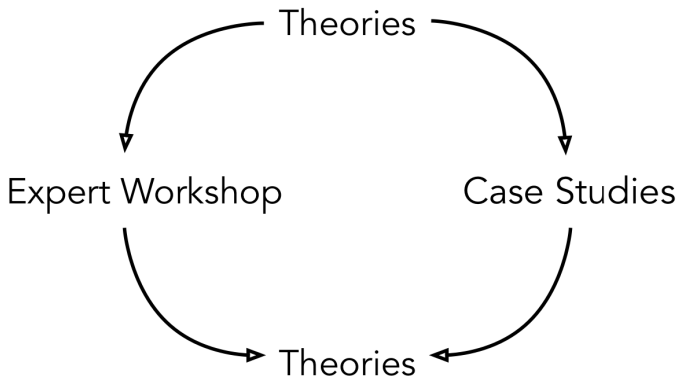

Fig. 8: Research design: The reciprocal approach of theoretical considerations and empirical investigation.

Qualitative studies are typically transparent with their methodological choices and their paradigmatic and epistemological commitments. The choices in this thesis are unavoidably informed by the basic assumptions and paradigmatic stance of the researcher (see Rau and Fahy, 2013, p. 12). Due to the researcher's paradigmatic positioning in critical theory and the methodological considerations of critical ethnography, adequate sampling strategies and methods of data collection and analysis were selected in order to fully answer the research questions. Details will be indicated in the following chapters. In summary, the thesis follows this approach:

Paradigmatic assumptions:	Critical theory (degrowth and its ties to critical theories)
Methodological approach:	Explorations in critical ethnography
Methods:	Interviews & focus groups
Data Type:	Qualitative
Analysis:	Thematic analysis

Paradigmatic assumptions: Critical theories as an empirical perspective

The theoretical chapters have, for a variety of reasons stated earlier, made extensive use of the term and concept of paradigm. Qualitative social researchers describe paradigms as an "intellectual understanding of how the world operates and how knowledge is produced" (O'Leary, 2004, p. 10). This thesis is intended to be another such critical qualitative social study, one that focuses on degrowth as a potential emerging critical social theory and understands knowledge as a continuously evolving process (see Kincheloe & McLaren, 2005, p. 305).

For Kincheloe and McLaren, critical research aims at the empowerment of people, through the fostering of "emancipatory consciousness" (ibid.). This understanding of critical research is in line with the scientific self-conception of sustainability research. Michelsen and Adomßent (2014) describe research in sustainability science as distinct from 'traditional' and 'basic' research, due to the ways that it is guided by the *normative* idea of sustainability and uses

sustainability as a framework for scientific analyses, with the aim of shaping sustainability transformations in human-environment-systems (Lang et al., 2014, p. 118). It is utilitarian, aiming to create new forms of knowledge and practical application for this knowledge (Michelsen & Adomßent, 2014, p. 42). For sustainability research, the main goal of generating knowledge is to make it "solution-oriented, socially robust, and transferable to both the scientific and societal practice" (Lang et al., 2012, p. 27).[102] This thesis aims to generate knowledge of this kind. It also hopes to contribute to developing "emancipatory consciousness" (Kincheloe & McLaren, 2005, p. 305) among the research participants.

Critical social researchers also argue that they operate in their role while being conscious of the contemporary hegemonic ideology, the power relations that are historically constituted and how those power relations influence the ways in which we understand the social world (see ibid., p. 310).[103] The research to this study was carried under awareness of this context. Throughout the qualitative process, the researcher should be critically self-reflective, especially in relation to the biases inherent in the entire research process, from the first steps of planning to the final interpretations (Miles et al., 2014, p. 104). Guba and Lincoln (2015) point out that the *voice* used in critical theory is one of a "'transformative intellectual' as advocate and activist" (Guba & Lincoln, 2015, p. 194). Such a conception of what a critical researcher should be fits well with the perspective of degrowth.

Methodological approach: Explorations in critical ethnography

Ethnography aims to "understand, describe, and interpret a way of life from the point of view of its participants" (O'Leary, 2004, p. 10).[104] *Critical* ethnography, the underlying methodology in this thesis, is also concerned with oppression and power relations in societies (see Carspecken, 1996, pp. 5; Kincheloe & McLaren, 2005, p. 305).

Phil Carspecken has contributed significantly to the development of critical ethnography. He suggests that the discipline is driven by the motivation to

[102] In "Methods and Methodology of Sustainability Science", Lang et al. (2014, my translation) state that in qualitative social research designs in sustainability science, *grounded theory* is paradigmatic (ibid., p. 132). However, this notion cannot be generalized, as indicated by this study.

[103] "We are defining a criticalist as a researcher or theorist who attempts to use her or his work as a form of social and cultural criticism and who accepts certain basic assumptions: that all thought is fundamentally mediated by power relations that are social and historically constituted; that facts can never be isolated from the domain of values or removed from some form of ideological inscription; that the relationship between concept and object […] is often mediated by the social relations of capitalist production and consumption; […] and, finally, that mainstream research practices are generally, although most unwittingly, implicated in the reproduction of systems of class, race, and gender oppression" (Kincheloe & McLaren, 2005, p. 304).

[104] While many ethnographic schools classically aim to produce 'thick description' (Geertz, 1973), meaning highly descriptive, rich and reflexive interpretations, this study does not aim to produce such thick descriptions or to describe what has happened in a single, bounded context in detail. Instead, this study focuses on a theme due to its aim to produce generalizable and transferable results to other contexts and a deepened understanding and explanation (Miles et al., 2014, p. 101).

not only understand and explain the mechanisms of oppression (see also Freire, 1972), but also to change them (Carspecken, 1996, p. 8).[105]

Critical ethnography aligns well with the methodological developments in sustainability research. Sustainability science is generally considered to be problem-driven and solution-oriented, following a transformational agenda (see Lang et al., 2012, p. 40; Lang et al., 2014, p. 117; Wiek, Ness et al., 2012, p. 6). Researchers in the field are not concerned exclusively with 'objectivity' and generalization, but aim also to contribute to "societal problem solving" (Hirsch Hadorn et al., 2006, p. 121) by participating actively with their work in sustainability transformations (e.g. Fischer et al., 2012, p. 8, see also Brandt et al., 2013, p. 8).

Using this orientation of sustainability research along the theoretical lines of critical ethnography, this thesis seeks to generate knowledge and theories that help to not only understand "how the beliefs of people are all ensnared within oppressive relations" (ibid.), but also reconstruct and develop a theoretical contribution that could change such mechanisms.

4.3.1 Case studies: sampling & methods of inquiry

As mentioned above, the first research unit of the 17 case studies comprises 34 interviews with 17 participants from four (three non-formal, one formal) adult educational programs. The research was conducted in 2015 and 2016 in Germany and Switzerland in four different educational programs focused on degrowth, socio-ecological transformation or ESD.

Case study research aspires to "tell-it-like-it-is from the participants' point of view" (Stark & Torrance, 2005, p. 34). For some, the goal is to understand a particular case rather than generalizing abstract issues, while others aim at generalizability (ibid., p. 33). This thesis privileged in-depth inquiry over coverage (ibid.). In line with the critical ethnographic approach of this study, the *cultural* group of participants of educational programs about degrowth and socio-ecological transformations are the individuals from within the learning process. The research questions are addressed by comparing and contrasting different cases (Stake 1995, p. 4).

[105] "The precise nature of oppression, however, is an empirical question and not a given belief. Much of our research attempts to clarify how and where oppression works. This is not a straightforward matter, since the identities, the forms of thinking and the beliefs of people are all ensnared within oppressive relations. We need a rigorous epistemology to pursue our subtle investigations, one that is universal to all forms of research. It is this rigorous epistemology that is definitive for critical methodology" (Carspecken, 1996, p. 8).

Sampling of the case studies

Along with the ethnographers LeCompte & Schensul, a sample is "a systematically selected subset of a larger population[106] that has been identified and whose units of analysis have been defined prior to the sampling process" (LeCompte & Schensul, 2010, p. 170). For ethnographic studies, to understand the "perspective of the researched" (O'Leary 2014, p. 120) the persons researched need to meet the prerequisite of a shared *community or culture* (ibid.). The selection of groups was determined by pragmatic concerns (e.g. opportunities, time etc.), as well as by intrinsic interest, theory etc. (ibid.).

The sampling strategies in this study are theory-driven. Theoretical sampling is characterized by the systematic choosing of research units[107] (Glaser & Strauss, 1986). Such choices include, for instance, the questions of who should take part, as well as where and when the research should take place (see ibid.; O'Leary 2004, p. 31; Miles et al., 2014, p. 30). The sampling strategy determines the quality of conclusions that may be drawn from the results and thus is crucial for the entire study's validity. For both research units, different sampling strategies were applied. They are explained in more detail in the following sections. The details of the finally realized sampling in the study are displayed in tables 4 and 7.

For the case studies, two different sampling strategies were applied. For the selection of the 4 educational programs as a 'pool' for the individual case studies, the sampling strategy was 'exploratory/progressive' (Miles et al., 2014, p. 31).

The idea behind this strategy is to add more differentiation and depth to findings and conclusions in different programs. The sampling for the educational programs required a search process, which began with identifying suitable educational programs for degrowth and socio-ecological transformations. This identification started with the advertisements and self-descriptions of the educational programs. The choice of the programs was made using theoretical and pragmatic sampling criteria (see table 1) that were defined based on prior experience with educational programs in the field of research. Ideally, the programs of choice should meet both theoretical and pragmatic criteria.

[106] According to O'Leary, a 'population' in empirical research is "the total membership of a defined class of people, objects, or events" (O'Leary, 2004, p. 102).

[107] The term 'theoretical sampling' initially comes from grounded theory methodology (Glaser & Strauss, 1986) but found broad application in other methodologies as well.

Tab. 1: Theoretical and pragmatic sampling criteria for the choice of educational programs.

Theoretical sampling criteria	Pragmatic sampling criteria
• Programs of exploration: Theme of the program in line with degrowth and socio-ecological transformations, according to consultation with project coordinator(s) • Contrasting programs: Theme of the program 'uncritical/mainstream' ESD or unspecific 'changemaker' • All programs: Thematic orientation focused on initiating change processes by impacting prospective actions or the imaginary of participants	• Implementation phase between 07/2015 and 12/2016 • Openness and interest of coordinator and institution to allow research • Non-formal program (one school program chosen to enable contrasting)

The search for the programs was conducted in German-speaking countries, primarily in the non-formal educational community. It was challenging to find and identify enough educational programs that fulfilled all theoretical *and* pragmatic sampling criteria as displayed in Table 1. This is because the research on degrowth and education is still emerging, as are practical educational programs in the field. This resulted in a lack of choice for the programs. However, most of the chosen programs focused on social and environmental sustainability. They aimed to foster practical change processes and develop alternatives on a local level. Moreover, they aimed to change not only individual habits of consumerism but to indirectly prompt social transformations by triggering personal reflections on the part of the participants.

Initially it was intended to include at least two different educational programs in the research in order to enable contrasting and comparisons between cases. Due to the limited number of educational programs that met all theoretical *and* pragmatic criteria, the finally realized sample contains two educational programs ('programs of exploration') that met all sampling criteria and two programs ('contrasting programs') that only met the criteria to a limited extent. If both theoretical and pragmatic sampling criteria were met (see Tab. 1), the programs functioned as a pool for finding the 'cases of exploration'. The focus on degrowth is especially present in the two programs of exploration (see Tab. 2, a and b). If all pragmatic but not all theoretical sampling criteria could be met (see Tab. 1), the program functioned as a pool for contrasting cases ('contrasting programs'), which support the conclusions to be contrasted. The pool for contrasting cases consists of two programs with a focus on ESD or 'changemaking' in general but not specifically on degrowth and socio-ecological transformations (see tab. 2, c and d). Table 2 presents an overview of the specifications and parameters of each program. All target audiences are young adults.

Tab. 2: Overview and specifications of realized sampling on the level of educational programs.

Program	a) Program of exploration: Theater Workshop	b) Program of exploration: FreiRaum	c) Contrasting cases: Project class	d) Contrasting cases: imp!act
Full name	*Zeitwohlstand Theaterwerkstatt zu mentalen Infrastrukturen der Beschleunigung*	*FreiRaumEroberung*	*Global and local change*	*imp!act*
Institution/ Provider	*Konzeptwerk Neue Ökonomie e.V.*[108] (KNOE) & Transition Theater[109]	*Naturfreundejugend Deutschlands*[110] *(NFJD) & Bund der Alevitischen Jugendlichen in Deutschland*[111] (BDAJ)	High school (anonymous)	euforia[112]
Keywords	• Time prosperity • Mental Infrastructure • Societal acceleration • Theater of the oppressed • Personal drivers of growth	• Socio-ecological transformations • Pioneers of change • Socio-ecological change • Social innovations • Alternative ways of living and consumption • "Conquering free spaces": Urban Gardening, sharing/giving economy and upcycling	• Projects for social and environmental change on local level • Global socio-ecological issues • Developing action-orientated solutions	• Skills for 'changemakers' • Developing solutions for social and environmental problems • Collaboration • Independent social and environmental projects
Target audience	Mainly students between 20-35	Mainly members of NFJD and BDAJ, mainly pupils and university students	Pupils of an elective project class in the final year of schooling	Young 'active' adults, mainly university students
Timeframe	08/2016	04/2015 – 09/2016	09/2015-06/2016	04/2016
Location	Village in Brandenburg	Hannover, Berlin, Göttingen	anonymous	Berlin
Format	Single seminar week/theater workshop	Multiple seminar weeks and weekends/workshops	Project course & final thesis	Single seminar week/workshop
(Non)-Formal	Non-formal	Non-formal	Formal	Non-formal
Number of participants	15	16	23	24
Number of case studies	5	8	2	2

After identifying suitable educational programs, the next step of the sampling was to find individuals involved in social processes such as developing skills and gaining knowledge. Not all of the participants of a program were included in the sampling. This second step was necessary to make sure that 'degrowth

[108] https://www.konzeptwerk-neue-oekonomie.org/, *Date of access: 31.05.2019*.
[109] https://www.transitiontheater.net/, *Date of access: 31.05.2019*.
[110] http://www.naturfreundejugend.de/, *Date of access: 31.05.2019*.
[111] http://bdaj.de/index.php, *Date of access: 31.05.2019*.
[112] http://www.euforia.org/, *Date of access: 31.05.2019*.

and socio-ecological transformation' was a key issue for the selected participants. Subsequently, a second layer of sampling strategy was applied.

The sampling strategy for the choosing of the individual case studies (CS), as well as the choice of participants out of the 'pool' of the 4 educational programs, was 'multiple-case sampling' (Miles et al. 2014, p. 33). In multiple-case studies, the researcher must decide which types of cases to include in the project (see ibid, p. 30). Using multiple-case sampling helps to add confidence to findings and conclusions by strengthening the precision, validity, stability, and trustworthiness of the results (ibid., p. 33). The choice of cases was made on conceptual, rather than representative grounds, based on the theoretical sampling criteria indicated below in Table 3.

Tab. 3: Theoretical and pragmatic sampling criteria for sampling of individuals in case studies. Ultimate criterion in bold.

Theoretical sampling criteria	**Pragmatic sampling criteria**
• Participant in one of programs *a* to *d* • Age between 18-30 (young adults) • **Cases of exploration: degrowth/growth critique as personal concern** • Intention to initiate change processes (project or lifestyle) in the near future	• Participant in one of program *a* to *d* • German-speaking • Interest and openness in participation • Availability for second interview

The number of case-studies was not pre-defined. The choice of individuals that were concerned with degrowth/growth critique was much easier than the choice of degrowth-related programs. Such a concern was identified in an informal briefing prior the interviews. As a result, the cases from program *a* and *b* are the 'cases of exploration' and the cases from program *c* and *d* are the 'contrasting cases'. Together, they formed the 'unit of exploration' for the research unit 1 as displayed in Table 4.

Tab. 4: The realized sample of 17 individual case studies forms the unit of analysis (2 interviews each) according to their participation in one of the four educational programs.

Number	**Name**[113]	**Educational program**	**Keywords: Project or topic**	**Age**
1	Pip	a) Theater Workshop	• Application in personal network • Change in personal lifestyle	26
2	Chris	a) Theater Workshop	• Application in national network • Workshops for degrowth multipliers/educators	29
3	Alexis	a) Theater Workshop	• Application in personal network • Change in personal lifestyle	26
4	Vanja	a) Theater Workshop	• Application in national network • Theater workshops for degrowth & antiracism	21

[113] All participants' names and cities have been anonymized or changed.

5	Blair	a) Theater Workshop	• Application in national network • Theater workshops for prosperity in time	20
6	Jordan	b) FreiRaum	• Application in regional network • Swap-party (clothes/stuff)	18-19
7	Riley	b) FreiRaum	• Application in local congregation • Urban gardening	19-20
8	Lee	b) FreiRaum	• Transition network in hometown • Urban gardening	21-22
9	Terry	b) FreiRaum	• Application in local congregation • Urban gardening	25-26
10	Gray	b) FreiRaum	• Application in regional community • Upcycling workshops	19-20
11	Neo	b) FreiRaum	• Application in local community • Upcycling workshop	27
12	Tal	b) FreiRaum	• Application in personal network • Awareness talks and lifestyle	18-19
13	Jody	b) FreiRaum	• Application in local community • Rescued food cooking event	25
14	Noor	c) Project class	• Application in global & local network • Educational funding program	18
15	Zan	c) Project class	• Application in local school & community • Foodwaste classes & bee-friendly garden project	18
16	Celeste	d) imp!act	• Application in regional network • Crowdfunding campaign for sharing network	30
17	Addison	d) imp!act	• Application in regional network • Crowdfunding campaign for sharing network	29

Methods of inquiry: pre- and post-interviews

Interviews are a very common method of inquiry in case studies (see Stark & Torrance, 2005, p. 35). In this study, 34 (17x2) problem-centered, semi-structured interviews were conducted with the individuals listed in Table 4.[114] The interviews were conducted in two survey cycles (pre- and post-interviews), resulting in two interviews per person (app. 1hr each). The first interview was conducted during an early phase of the program or directly after the individuals had participated in the program. The follow-up (post-) interviews were conducted 3-4 months after participating in the program in order to consolidate the interpretations (Miles et al., 2014, p. 92).

In the conception of 'problem-centered, semi-structured interviews', 'problem-centered' refers to the orientation and communication of interviews on "socially relevant problems" (Witzel, 2000). They are 'semi-structured' because the interview situation is reasonably open, yet still structured, thus providing space to discuss the topics personally relevant to the interviewee (see Niebert & Gropengießer, 2014, p. 122). These interview situations followed a 'narrative principle' that has the advantage of eliciting answers that are freely

[114] Due to practical reasons, the entire process of data collection (focus groups & case studies) and parts of the analysis were conducted in German as it is a fluent conservation language to all of the participants and the interviewer. Data was collected using two audio recording devices. The original transcripts were only translated when quotes were selected for display in the results chapter.

formulated, and the interview texts provide the option of combining a-priori (deductive) and inductive code construction (see section 4.4).

Following Witzel (2000), the following supportive instruments were applied to the data collection in the interviews: a short, standardized questionnaire on social characteristics (age, education, etc.) (see also Kuckartz, 2014, p. 158); interview guidelines (see Tab. 5)[115]; and a tape recording of the interview (Witzel, 2000). The interview guidelines were developed based on the research questions but included a number of additional questions to also give the interviewee space for free elaborations on related aspects. For research questions 3-5, the participants of the case studies were interviewed about their appraisal of the knowledge elements, competency components and pedagogical approaches of the programs in which they participated.[116]

The style of the interviews was casual and as free as possible from hierarchical relations. This was aided by the fact that the interviewees were already acquainted with the interviewer prior to the interview situations.

Tab. 5: Interview guidelines for both rounds of semi-structured interviews in pre-formulated wording.[117]

Interview Guidelines
1. How did you first hear about the program [a-d] and what particularly interested you in it?
2. Have you dealt with topics of degrowth in the past?
3. Have you dealt with topics of socio-ecological transformations in the past?
4. Please describe your past experiences with societal topics such as sustainability, degrowth and socio-ecological transformations.
5. Please describe your experiences with societal change and what it means to you.
6. Can the program [a-d] be distinguished from previous programs/seminars etc. that you participated in? If yes, in what way?
7. Have you supported or engaged in sociopolitical topics before? If yes, in what way?
8. What does a target state of a sustainable society look like for you?
9. What does a target state of a degrowth society look like for you?
10. Please describe which competencies & abilities people need to have for degrowth.
11. How do you evaluate you own abilities in that regard?
12. Please describe which knowledge elements people need for degrowth.
13. How do you evaluate you own knowledge in that regard?
14. Which abilities do you need or would you need to contribute to socio-ecological transformations?

[115] The researcher or interviewer follows pre-set guidelines including certain topics and themes that are to be asked within the course of the interview while the order and wording of the questions can be modified (Lamnek, 2010, p. 393).

[116] The interviewees have two roles (see Tab. 8). On the one hand, they are "the real objects of investigation" (Bogner & Menz, 2009, p. 47). On the other hand they are "experts on their own life" (Bogner & Menz, 2009, p. 47, see also Mayring, 1996, p. 49) which is based on the idea, that "every human being is in possession of particular information, capacities and so on which equip them to deal with their own everyday life" (Bogner & Menz, 2009, p. 499). For this thesis, this means that the interviewee's perspective is considered to add crucial value from *within* the educational experience as *participants/'person concerned'*.

[117] The precise order and wording of the questions was adjusted to the respective interview situation. Additional and further questions were included dynamically if considered appropriate or necessary for understanding.

15. Please describe which supportive factors and/or obstacles people face when shaping a degrowth society?
16. What would pedagogy look like if it were to contribute to societal change?
17. What would pedagogy look like if it were to contribute to a degrowth society?
18. Please describe which educational opportunities/pedagogy you consider especially helpful for degrowth/socio-ecological transformations.
19. How would you describe your own role in society in regards to socio-ecological transformations?
20. Please formulate detailed feedback regarding the program [a-d]. What did you like? What could be improved?
21. Do you participate in your own projects concerned with degrowth/socio-ecological transformations? If yes, how does/did program [a-d] influence your own project work?

4.3.2 Expert workshop: sampling & methods of inquiry

The second research unit of this thesis is the 5 focus groups that were conducted in an expert workshop with 11 participants specialized in research and praxis of either ESD or degrowth. This expert workshop was conducted in September, 2016, at the University of Zurich and bore the title *Degrowth Education*[118] – *Competencies and knowledge for a society independent from growth*[119].

'Expert workshops' are used not only as a research method but also for a variety of purposes, such as decision-making, information consolidation or creative problem-solving (see Andler, 2016, p. 85). In this thesis, the workshops functioned as a designed setting in which to conduct the inquiry with a group of individuals in possession of professional expertise, who would not have otherwise discussed the topic together in this way. The purpose of the workshop was to 'design' an environment for 'accumulated knowledge production' (see Andler, 2016, p. 85) in terms of the identified research gap of the thesis[120].

Sampling of the expert workshop

The development of the workshop began in early 2016 under the supervision of Prof. Irmi Seidl (WSL Zurich) and Prof. Kai Niebert (University of Zurich) and the professional moderator of the workshop (Dr. Astrid Björnsen Gurung, WSL Zurich). The workshop was held on one day in Zurich with 11 invited experts from the German-speaking ESD and degrowth communities (see tab. 11).

[118] The term 'degrowth education' functioned as a working title in the early phases of the doctoral project. A critical reflection on the use and its potential bias on the work is critically stated in the methods reflection in chapter 8.

[119] The workshop was held in German, original title: *'Degrowth Education' - Kompetenzen und Wissen für eine wachstumsbefreite Gesellschaft*.

[120] "The main focus [of systematizing expert interviews], is not on the interpretative character of expert knowledge but rather on its capacity to provide researchers with facts concerning the question they are investigating. […] From this methodological perspective, it is not the experts themselves who are the objects of the investigation; their function is rather that of informants who provide information about the real objects being investigated" (Bogner & Menz 2009, p. 47).

In the lead up to the workshop, a preparatory concept paper (Getzin, 2016, unpublished, see appendix) was formulated and sent out to the participants. The paper included a brief overview of the purpose of the workshop, the degrowth discourse and concepts of ESD. Throughout the workshop, the professional moderator guided the experts' discussion and a graphic recorder captured the outcomes of the workshop in the form of graphic minutes. To cover the three research questions (RQ3-5), the workshop had three parts in which five focus groups were conducted. The details for the focus groups will be given in the next section after introducing the sample.

The sampling strategy for the selection of experts was 'quota sampling'. It works by "identifying the major subgroups and then taking an arbitrary number from each" (Miles et al., 2014, p. 32). Because the situation of the workshop and the individuals involved in the expert workshop is unlikely to be repeated in that exact format again (see standard 4 for quality of conclusions – section 4.5), it is even more important to apply transparent and coherent sampling criteria in choosing the kinds of professional expertise involved.

Thus, the experts in the workshop were selected according to the quota of representatives of each subgroup of expertise. The experts in this thesis are all from the fields of either degrowth or ESD. Prior to the workshop, the desired quotas of varieties of expertise were determined with a view to creating balance in the sampling. However, in reality, many experts have overlapping fields of expertise, professional backgrounds and experience. In addition to the identified subgroups, certain pragmatic sampling criteria contributed to the assembling of the sample (see Tab. 6).

Tab. 6: Theoretical and pragmatic sampling criteria for the sampling of experts in expert workshop. (Envisaged quotas:realized quota) in brackets.

Theoretical sampling criteria	Pragmatic sampling criteria
• Expertise in degrowth (2:1) • Expertise in degrowth and education or psychology (5:5) • Expertise in sustainability education (5:5) • Mainly theoretical application/implementation (7:7) • Mainly practical application/implementation (3:3)	• Institution (academia/non-academia) • German-speaking community • Workplace & position • Interest and openness in participation • Availability on the date of the workshop • Travel distance to Zurich

Based on these criteria, and after identifying possible expert candidates according to the sampling criteria, a first round of invitations was sent out. This was followed by prospective participants confirmation of participation or refusal due to lack of availability on the set date. In contrast to the challenges posed by research unit 1 in finding adequate educational programs, it was relatively easy to find a round of experts that met all the sampling criteria. After a second

round of invitations was made, a sample was realized that met the demanded sampling quotas (Tab. 7).

Tab. 7: Realized sample of experts and list of other participants in the expert workshop that took place on 22nd September 2016 (alphabetic order).

Name of expert[121]	**Fields of Expertise**[122]	**theoretical/ practical foci**	**Institution**	**Workplace & position prior/at workshop date**
Susanne Brehm	Degrowth and education	practical	Konzeptwerk neue Ökonomie e.V.	Educational coordinator
Marcel Hunecke	Psychology of sustainable development	theoretical	Fachhochschule Dortmund	Professor (General psychology, organizational and environmental psychology)
Kerstin Küster	ESD	practical	Previously Greenpeace Deutschland e.V.	Campaigner for education & politics
Ueli Nagel	ESD	Theoretical and practical	Retired, previously Pädagogische Hochschule Zürich, SAGUF ESD,	Honorary consultant for environmental organizations
Kai Niebert	ESD	theoretical	Universität Zürich, Deutscher Naturschutzring	Professor (Science and Sustainability Education) & President of German Nature League (DNR)
Lukas Peter	Degrowth, democracy and education	theoretical	Universität Zürich	Assistant Researcher & PhD Student (Democracy Studies)
Kirstin Schild	ESD	theoretical	Universität Bern	Assistant Researcher (Centre for Development and Environment)
Irmi Seidl	Degrowth	theoretical	Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft	Professor (Head of Research Unit Economics and Social Sciences)
Robin Stock	Degrowth and education	practical	FairBindung e.V.	Trainer & Educational Coordinator
Ute Stoltenberg	ESD	theoretical	Leuphana Universität Lüneburg	Professor (Sustainability Science)
Corinna Vosse	Degrowth and education	practical	Akademie für Suffizienz	Managing Director
***Name of other* participants**	**Function in the workshop**	**-**	**Institution**	**Workplace & position**
Astrid Björnsen Gurung	Moderator	-	Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft	Head of Research Program "Energy Change Impact" & Moderator
Anna Fritsche	Graphic Recorder	-	Freelancer	Graphic Recorder
Sofia Getzin	Conception and Coordination	-	Universität Zürich, Leuphana Universität Lüneburg	Assistant Researcher & PhD Student
Sara Petchey	Funding and Support	-	Universität Zürich	Sustainability Coordinator at Faculty of Science

[121] After the workshop, authorization for reporting participants' names and the fields of expertise was confirmed.
[122] Theoretical and pragmatic sampling parameters were estimated prior to the invitation for the workshop.

Methods of inquiry: focus groups

'Focus groups' are located somewhere between 'one-to-one interviews' and 'groups of everyday lives' (see Barbour & Schostak, 2005, p. 43). They are a "social process, through which participants co-produce an account of themselves and their ideas which is specific to that time and place" (ibid.). In this study, 5 *systematizing* expert focus groups'[123] were conducted either with the full round of 11 experts or in 2 smaller sub-groups (see tab. 8).

Such kinds of focus groups in this thesis are intended to gather new insights with regards to participants' fields of expertise and to *systematize* and consolidate information (ibid.). They are "oriented towards gaining access to exclusive knowledge possessed by the expert" (Bogner & Menz, 2009, p. 46; see also Bogner et al., 2014, pp. 22)[124]. "The focus here is on knowledge of action and experience, which has been derived from practice, is reflexively accessible, and can be spontaneously communicated" (Bogner & Menz 2009, pp. 46). Barbour and Schostak (2005) suggest that, like interviews, focus groups are characterized by a dialogic approach, which has implications for the research design. In the setting of this thesis, all experts in the focus groups were given equal opportunities to contribute to the conversation.

The 5 focus groups in the workshop were conducted such a way that after the critical discussion of the concept paper and a theoretical input by the experts, two smaller focus groups (5-6 experts each) with a blend of fields of expertise were formed to discuss 'knowledge and topics' and competency components for 'degrowth education'. The discussions were supported by the moderator using visual media. After a certain period of time, the groups exchanged working questions in order to add to the results of the previous group. In a phase of synthesis, the two groups recombined to discuss the outcomes of each working question, beginning with a short summary by the groups' moderators.

Later in the workshop, the discussions focused on the pedagogical approaches of 'degrowth education'. The discussion took place in a plenary setting involving all participants, and focused on best practice in pedagogy, methods and educational opportunities in the context of 'degrowth education'. After clustering and summarizing the results of this phase, the moderator initiated a final round of discussion in which the experts each gave short concluding statements.

[123] Bogner & Menz (2009, p. 46) "distinguish between exploratory, systematizing and theory-generating expert interviews".

[124] Research with experts bears certain methodological and methodical challenges. According to Bogner and Menz (2009), one problem is that conversations with experts are particularly susceptible to interferences. One advantage of systematizing expert investigations is that data is gathered between experts and researcher as 'co-experts', resulting in a "high level of specialist knowledge, high density of facts" (Bogner et al., 2009, pp. 68).

Tab. 8: Five systematizing focus groups within the expert workshop

Experts_1	Discussion on knowledge and topics → conducted in two small groups with a change of groups at half-time → parallel to 'Experts_2'
Experts_2	Discussion on competency components → conducted in two small groups with a change of groups at half-time → parallel to 'Experts_1'
Experts_3	Reflections and concluding statements → conducted in the plenary with all experts
Experts_4	Discussions on pedagogical approaches → conducted in the plenary with all experts
Experts_5	General discussion on 'Degrowth Education' based on the concept paper → conducted in the plenary with all experts

4.4 Methods of Analysis: Thematic qualitative text analysis

The methods used for data analysis were largely informed by Kuckartz' *Qualitative Text Analysis – a Guide to Methods, Practice & Using Software* (2014) and Miles, Huberman and Saldaña's *Qualitative Data Analysis – a Methods Sourcebook* (2014). The chosen process of analysis is a synthesis of both publications, the "Thematic Qualitative Text Analysis" (Kuckartz, 2014, p. 69) and the analytic process as proposed by Miles et al. (2014) with two cycles of coding (First Cycle Coding and Second Cycle Coding) (ibid., pp. 69).

Both publications refer to the general process of qualitative text analysis that contains the following elements: "[r]ead[ing] and interpret[ing] the text", "[b]uild[ing] categories", "[c]od[ing] segments of the text", "[a]nalyz[ing]" and "[p]resent[ing] results" (Kuckartz, 2014, pp. 68). All of these steps are conducted while constantly re-adjusting the research questions (ibid.; Miles et al., 2014, pp. 68). The central aspects of this process that are relevant for this thesis will be described in more detail in the following sections.

Deductive-inductive coding and constructing categories

The ultimate goal of most kinds of systematic content analysis is the construction of interpretative categories based on an elaborated code-system for the entire data set (see Kuckartz, 2014, pp. 69). Coding is a reduction of complexity according to certain criteria, to be defined by the researcher(s) (Kuckartz, 2016, p. 32). In the social sciences, a code or category is similar to a 'class' or a 'classification of units' (Kuckartz, 2016, p. 31). Constructing codes and categories is an elementary psychological process and can be described as a 'classification' with the aim of reducing complexity in a structured way according to specific criteria (see Kuckartz, 2014, pp. 38). However, according to Miles et al. (2014), "coding *is* analysis" (Miles et al., 2014, p. 72), and enables not only condensation but also serves as a "method of discovery" (ibid., p. 73).

In line with the central characteristics of contemporary forms of qualitative text analysis, this study conducted a code-based, systematic analysis (Kuckartz, 2014, p. 68). According to the methodological requirements, the entire data material was coded to maintain high standards in meeting the quality criteria (see section 6.7) based on the entire material and not on single fragments or cases (ibid., p. 69).

The terminology of 'category' and 'code' in the international methods literature is not consistent and 'category' is often used synonymously for 'code', while in the German-speaking literature 'category' or 'category system' are preferred (Saldaña 2013, p. 9, see also Kuckartz, 2014; 2016). In this study,

'code' is used, in line with a differentiation made by Saldaña (2013, p. 9)[125]: This applies when data is labeled so that the results are codings of 'data chunks'. Examples for labels are 'E_B1.1' (experts codes) or 'CS_ii.1' (case studies code). They underlie the results of this thesis. The explanation for how these codes emerged is given below and examples are given in Fig. 9.

Coding occurs between two extremes: at one end, solely theoretical constructions and at the other, solely empirical constructions. The first extreme (based on existing theories) is referred to as *deductive* code construction, *a-priori* code construction or structuring[126] (Mayring, 2010, pp. 92; Kuckartz, 2014, pp. 55). The second extreme (based solely on empirical data) is referred to as *inductive* code construction[127] (Mayring, 2010, pp. 67; Kuckartz, 2014, pp. 58). According to Kuckartz (2014), the two extremes of the spectrum, completely inductive or completely deductively, are quite unusual in the research praxis (Kuckartz, 2014, p. 69). In this study, both methods have been combined in a *deductive-inductive code construction* (ibid., p. 62).

Unlike 'codes', the term 'category' is usually used when referring to interpretative labels and classifications of a higher order (Saldaña, 2013, p. 9). In this thesis, the classification system resulted from the process of triangulating both data sources (see section 4.4.1). Consequently, the presented categories in the results are 'triangulated meta-categories'. The processes of both this composite deductive-inductive code construction as well as category construction is described in the next section.

[125] "To codify is to arrange things in a systematic order, to make something part of a system or classification, to categorize. […] Coding is thus a method that enables you to organize and group similarly coded data into categories or 'families' because they share some characteristics - the beginning of a pattern" (Saldaña 2013, p. 9).

[126] Some researchers prefer to develop a provisional list of codes, prior to fieldwork, based on the theoretical conceptual framework, also called 'a-priori' (see Miles at al., 2014, p. 81; Saldaña, 2013).

[127] Inductive category construction has been broadly described by Mayring in the German literature on research methods. Mayring also called inductive category construction 'summarizing content analysis' (Mayring. 2010, pp. 67) – the steps of the technique are: paraphrasing, generalizing and abstracting the data (Kuckartz, 2014, p. 55).

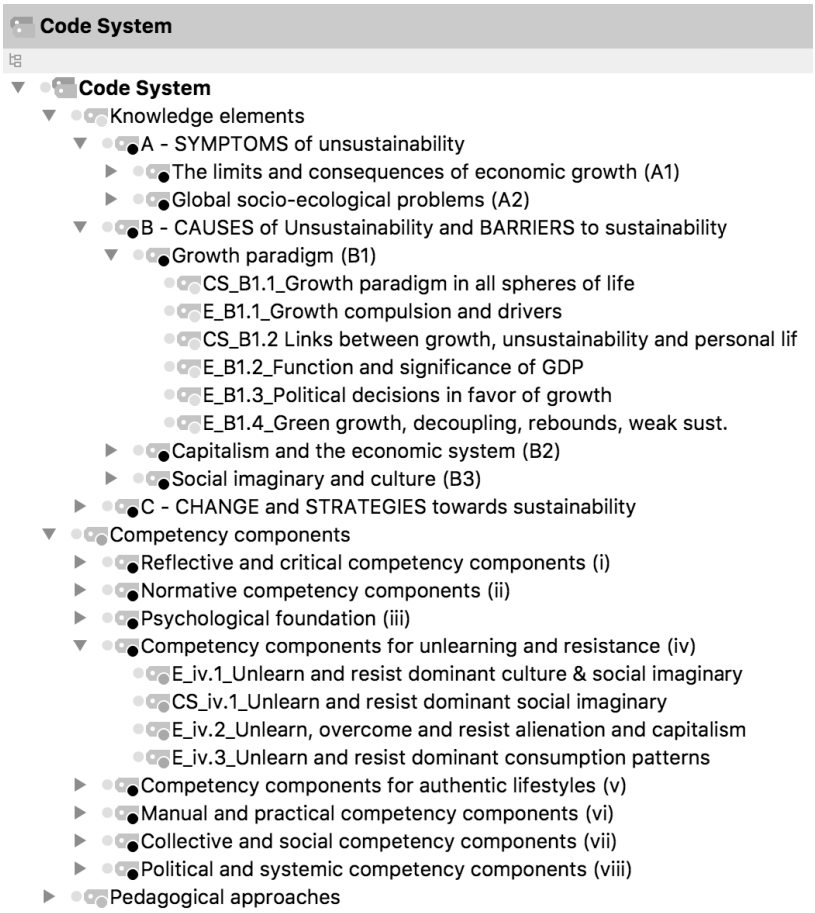

Fig. 9: Extract (screenshot) of MaxQDA12 (2018) software list of codes (starting with E_ or CS_)

Steps of Analysis and 'Two Cycle Coding'[128]

The entire data body was coded in the steps of analysis as visualized in Fig. 10. As suggested above, the following steps of analysis combine the approaches of Kuckartz (2014, pp. 69) and Miles et al. (2014, pp. 69). These steps are applied in both interviews *and* focus groups.

Examples of processed data in the codebook are given below Tab. 9. Before beginning the process of qualitative text analysis, all the audio material from the focus groups and interviews was transcribed.[129] All transcripts include time markers and have been processed using MaxQDA12 software for computer assistance in the analytic process.

[128] The term 'Two Cycle Coding' has not been used by Miles et al. (2014) but is used here to describe their proposed two analytic steps.

[129] Transcription of the German audio files was conducted by two professional transcription companies in accordance with transcription guidelines.

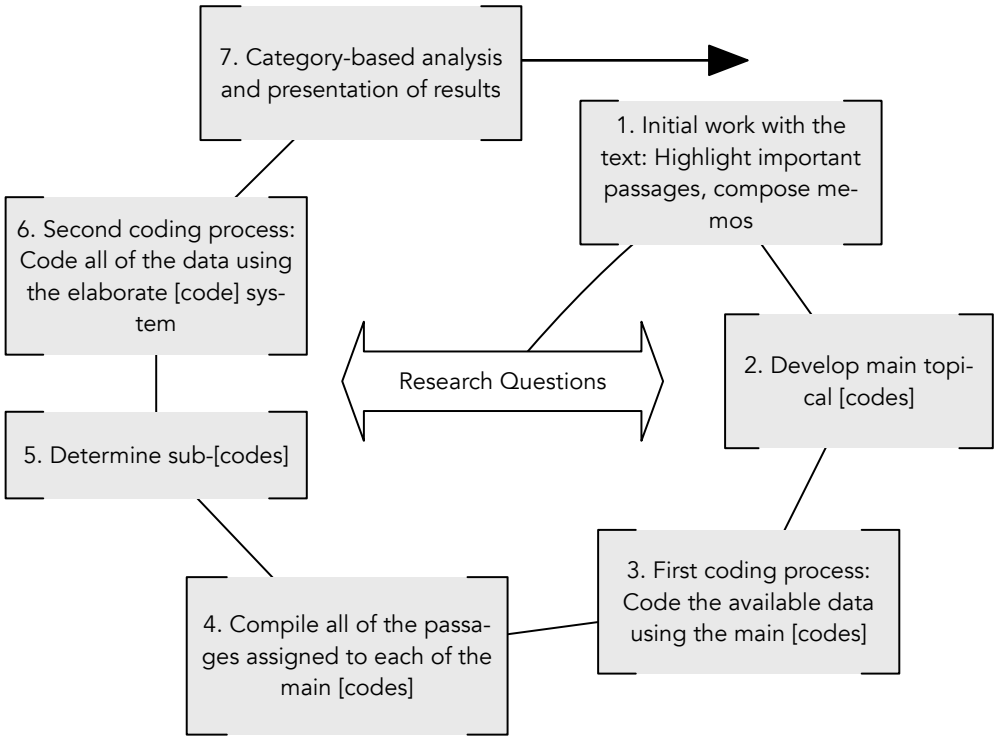

Fig. 10: Thematic qualitative text analysis process (Figure adapted from Kuckartz, 2014, p. 70).

1. *"Initial work with the text: Highlight important passages, compose memos" (Kuckartz, 2014, p. 70):* The first step comprises 'careful reading' of the transcripts of the interviews and focus groups (and listening to the audio) and the noting of particularly interesting aspects in short memoranda. This first step is concluded with the creation of short case summaries of each interview (Kuckartz, 2016, p. 58).
2. *"Develop main topical [codes]" (ibid.):* In this second step, the first coding process begins and codes are constructed. The main topics are derived 'a-priori'/deductively from the research questions (RQ3-5) (ibid., p. 72). The first round processes approximately 10-20% of the data. In this study, the first set of codes is theory-based and derived deductively along knowledge elements (RQ3), competency components (RQ4) and pedagogical approaches (RQ5).
3. *"First coding process: Code the available data using the main [codes]"* (ibid., p. 70): The entire data is coded during this first structural coding process according to the *a priori* codes. The a-priori system contains only a few broad codes, which are derived from research questions 3-5. In this first coding process, all 'informative' passages are coded, sometimes multiple times with overlapping codes. All passages that do not include information remained uncoded.

Saldaña (2013) and Miles et al. (2014) call this initial process *first cycle codes and coding* (Saldaña, 2013, pp. 3; Miles et al., 2014, pp. 71). In the

first cycle coding, codes to data chunks are assigned to detect recurring patterns using 'structural coding' (see Saldaña, 2013, pp. 84). According to Kuckartz (2014, pp. 72), the following rules apply for the first process (ibid., p. 74): Coded units are defined by semantic boundaries (full sentences or complete thoughts, sometimes encompassing multiple sentences or paragraphs). In this step, a co-operative approach to coding is applied. This consensual coding ensures reliability. In this thesis, 10% of the data was coded by consensual coding. Moreover, a codebook was developed, which includes the names of codes, descriptions of them and data examples (Miles et al., 2014, p. 84, see table 9 for examples). A comprehensive codebook was modified many times throughout the research process. It is essential to keep a record of changes, progress and emerging codes throughout the entire process of analysis. Describing codes clearly is one method of ensuring the quality of conclusions (see section 4.5).

4. "*Compile all of the passages assigned to each of the main [codes]" (ibid, p. 70):* This step is the basis for step 5, as it entails compiling all previously coded passages of one code as a base for further differentiation (see ibid., pp. 75).

5. *"Determine sub-[codes]" (ibid., p. 70):* Following the compiled passages, sub-codes are formulated by the researcher (see ibid., p. 76). The a-priori coding system "needs revision" when it is "not applicable to the data or the newly emerging inductive system looks more promising" (Miles et al., 2014, p. 81). The differentiation into inductive sub-codes in this study was oriented along the interview guidelines, with more detailed aspects determined according to the perspectives of the interviewees and focus groups. However, the analytic process is cyclical rather than linear (see Saldaña, 2013, p. 58; Kuckartz, 2014, p. 70) which means the inductive coding process is conducted using a circular or spiral approach (see Kuckartz, 2014, p. 69).

6. *"Second coding process: Code all of the data using the elaborate [code] system"* (ibid., p. 70). In the second coding process, the entire data set is coded using a more elaborate code system and coding scheme, including all sub-codes (ibid., pp. 79). Coding rules apply as in step 3. The challenge is to find the appropriate scope of sub-codes.

   Miles et al. (2014) call this process *second cycle codes and coding* (Miles et al., 2014, pp. 86), in which the codes are more elaborate and reveal initial patterns that form the basis for interpretation. Writing memoranda throughout the process helps to keep track of cross-references as well as ideas, thoughts, and doubts about the data that arise while processing the analyses (see e.g. ibid., pp. 93).

7. *"Category-based analysis and presentation of results"* (Kuckartz, 2014, p. 70). The final phase is the analysis and presentation of the results of the data (ibid., pp. 84). The process of condensing and clustering is the initial step

towards drawing interpretations and conclusions (see Miles et al. 2014, p. 72). Kuckartz (2014) suggests different styles of analysis according to the research design (ibid., pp. 84). In this thesis, they are orientated along meta-categories formed by the process of triangulation, as outlined in the next section. Section 4.6 gives more details on the display of the data and the manner in which the empirical results are presented.

Tab.9: Example of codebook including name of code, code description and data examples

Name of code	Code description (inclusion & exclusion criteria)	Data examples
CS_B2.1_Basic conception of economic and financial system	• Reference or comments about the importance of knowing basics about the economic system or the financial system. • Includes vague notions of economic literacy. • Excludes notions that address the social order and/or capitalism (represented in code CS_B2.2).	"If it is about the economy or the financial system, then I think it is necessary to have a conception about it, to subsequently being able to intervene in it and to know what needs to be changed and what's possible at all. For this you need to be well informed." (Alexis_2: 43) "I am not so sure how it is exactly about the economic system. If it is supposed to be a society with an economy, then yes: I think it is definitely useful to be literate in this regard." (Blair_1: 64)
E_REF1_Foster critical reflections of themes, social imaginary, experiences & good life	• Reference or comments on the importance of fostering critical reflections on certain experiences made in educational settings. • Includes reflections on themes or frames of reference or the 'good life' in general. • Includes comments on the interconnection between action and reflection. • Excludes references or comments on fostering the practical experience itself (represented in code E_ACT1).	"In outdoor pedagogy for instance: Like thinking about certain topics while hiking – connected to small rounds of reflection and collective motion in nature"" (Experts_4: 80) "Reflections about the inner mental infrastructures and frames and the social imaginary of economic growth" (Experts_3: 37) "I would like to place two things in a mutual relation: To initiate change process in learners, two things are needed. Learners need to experience things and to reflect these experiences. Or they need to reflect first and in the next step experience."(Experts_4: 77)

4.4.1 Data triangulation of the two research units

The concept of triangulation[130] was first introduced to qualitative research by Denzin[131], with the aim of providing additional methods to any empirical investigation (Flick, 2014b, p. 418). According to Miles et al. (2014), "[s]tripped to its basics, triangulation is supposed to support a finding by showing that at least

[130] "Triangulation means that researchers take different perspectives […] in answering research questions. These perspectives can be substantiated in using several methods and/or in several theoretical approaches. Both are or should be linked. Furthermore it refers to combining different sorts of data on the background of the theoretical perspectives, which are applied to the data. As far as possible, these perspectives should be treated and applied on an equal footing and in an equally consequent way" (Flick, 2014a, p. 445).

[131] Denzin's central concept of triangulation from the 1970s is methods triangulation which can be implemented 'within-method' or 'between-method' (Flick, 2014b, p. 418).

three independent measures of it agree with it or, at least, do not contradict it." (ibid., p. 299). It is a way to double-check findings (ibid., p. 300), which can help to validate findings, and also lead to different findings that are complementary to one other (Kelle, 2014, p. 157)[132].

Flick (2014b) argues that the use of triangulation is often misunderstood in the literature. It is not an approach primarily intended to validate, verify and/or confirm data; rather, the overall aim of triangulation is to acknowledge the contradictions and variety of the objects of investigation. Thus, triangulation aims to not only check and verify results but also enable deep conclusions to be drawn (Flick 2014b, p. 419). In any case, combining multiple perspectives and practices in empirical research adds depth and density to a study (see Denzin & Lincoln, 2005, p. 5; Flick, 2014a, p. 229). Such aspects will later be discussed in terms of the credibility of the study.

In this thesis, data triangulation is applied from more than one independent data source to make the findings more dependable (see Bogner & Menz, 2009, p. 95; Miles et al., 2014, p. 307). The two independent data sources are the two research units with interviews and focus groups. The steps of analysis as outlined above were applied in separate ways to the two research units, resulting in two different code systems for the case studies (CS_) and experts (E_).

As the result of the abovementioned process of multilevel deductive-inductive analysis, codes of 'knowledge and topics', 'competency components' and 'pedagogy and principles' were reconstructed in two separate code systems. After the strictly separate construction of two code systems and their concise display in two separate matrices (Kuckartz, 2016, p. 50; Miles et al., 2014), they were interpreted for similarities and differences, overlaps and gaps by data triangulation. Subsequently, one superordinate system of meta-categories was triangulated (see Fig. 11). Both code systems were integrated into one matrix along the triangulated meta-categories, which have the advantage of organizing data into an "'at-a-glance' format for reflection, verification, conclusion drawing, and other analytic acts" (Miles et al., 2014, p. 91).

This process is part of the *second cycle coding processes* (see previous section, step 6 of data analysis). The aforementioned analytical matrices display thematic and analytic summaries of the research process in an organized and compressed way (Kuckartz, 2014, pp. 80). Based on the deductively structured data bodies in knowledge elements, competency components and pedagogical approaches, inductive codes were reconstructed for experts and case studies. Code/data triangulation led to triangulated meta-categories. Matrix displays were applied at many intermediate steps of the analytic process in this study, but especially in the final synthesis of the two research units (see below in Fig. 11).

[132] This goes especially for the case of methods triangulation (ibid.).

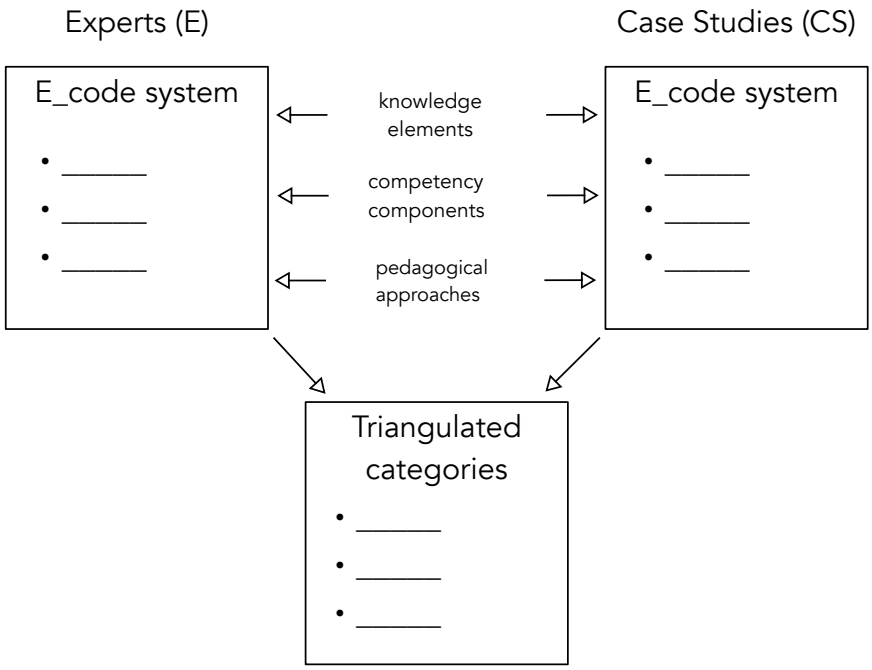

Fig. 11: Overview of process of data analysis, coding, and triangulation.

4.5 Quality criteria

The previous sections of this chapter have given detailed descriptions of this thesis' approach, paradigmatic assumptions and methodology, methods of inquiry and analysis. However, "all studies, regardless of goals or even their paradigmatic positioning, need to consider whether: subjectivities have been managed; methods are approached with consistency; 'true essence' has been captured; findings have broad applicability; and, finally whether findings can be verified" (O'Leary, 2004, p. 114)[133]

Such considerations can lead to research strategies. But even well-executed strategies to do what the quote suggests do not necessarily "make for good conclusions" (Miles et al., 2014, p. 311). Therefore, strategies for meeting the quality criteria are presented below. In this thesis, the quality criteria are informed by Miles et al. (2014, p. 311), who propose five quality criteria as outlined below. The strategies for meeting each criterion will be described. In brackets after each standard, the arrow points at the chapter or section where the respective standard is addressed. In section 8.1, in the beginning of the overall discussion of this thesis, the application of the quality criteria will be reviewed.

Objectivity

Objectivity in qualitative studies is "framed as one of relative neutrality and reasonable freedom from unacknowledged researcher biases" (Miles et al., 2014, p. 311). In quantitative studies, this would be labeled as external reliability. Following Miles et al.'s suggestions (ibid., pp. 311), this thesis ensures it meets the quality criterion of objectivity via the following strategies:

- describing the strategies and methods to enable the reader to follow in detail (→ chapter 4);
- displaying and presenting the methods and results chapter in a transparent way so that the reader can follow how the data was collected, analyzed and transformed as a base for the interpretation (→ chapter 4-7);
- linking interpretations and conclusions to parts of the data (→ chapter 5-7);
- being transparent about the researcher bias in the way that the researcher is 'self-aware' of their personal imprint on the empirical process (→ section 4.3 and 8.1)

[133] Traditionally, indicators of 'good' research emerged from positivist assumptions, including objectivity, reliability, validity, generalizability and reproducibility (O'Leary, 2004, p. 64). Flick (2014b) states how quality criteria in *qualitative* research include clearly justified choice of methods; concrete description of steps; clearly identified project aims; transparently outlined steps that enable the reader to judge if the criteria are met (Flick, 2014b, p. 422).

Reliability

This thesis aims to ensure the transparency and traceability of the process via well-ordered documentation (see Flick, 2014b, pp. 420). As one criterion to quality, a study needs to be stable and consistent over time, researchers and methods. Following Miles et al.'s suggestions (ibid., p. 312), this thesis aims to ensure reliability by:

- clearly defining research questions (→ chapter 1 and section 4.2);
- clearly explicating the basic paradigm (→ section 4.3);
- displaying and considering parallelism across data sources with data triangulation (→ section 4.4.1 and chapter 5-7);
- ensuring intercoder reliability by intercoder agreement checks in team-codings and collective codings (see ibid., p. 84). Intercoder reliability is understood to be crucial to the quality criteria and therefore pursues sub-strategies such as exemplary consensual coding (see Kuckartz, 2014, p. 74). In this study, this was conducted with a second coder from a research group of peer researchers for a pre-defined block of the data (German: 'Forschungswerkstatt') in order to limit the individual bias. Successful consensual coding is based on a well-described code system and coding scheme including examples. If different analyses occur due to disagreement, then those differences need to be reconciled (ibid.) (→ sections 4.4 and 8.1).

Internal validity/credibility

For this standard, the question is whether the study's findings make sense to the reader. "[N]egotiating researcher subjectivities" implies "approaching methods with consistency, and ensuring [that] research processes can be audited, or even reproduced" (O'Leary 2004, p. 103). Following Miles et al.'s suggestions (Miles et al., 2014, pp. 313), this thesis applies the following strategies for ensuring internal validity/credibility by:

- recording and transcribing the data (→ section 4.4);
- applying a consistent, well-structured and coherent codebook, including examples of codings (→ section 4.4, Tab. 9 and appendix);
- applying 'communicative validation' (Flick 2014b, pp. 413) in the form of consolidation through two pre-/post-interviews per person in the case studies (→ section 4.3.1);
- applying data triangulation using a number of data sources which are independent from each other (Miles et al. 2014, p. 307; Flick 2014b, p. 418) (→ section 6.6.2);

External validity

This standard aims to ensure the generalizability of the results. The key concern is whether the findings can also be transferred to other contexts (see Miles et al., 2014, p. 314). Following Miles et al.'s suggestions (ibid.), this thesis aims to ensure external validity:

- clearly outlining the sampling strategies and the sample in a detailed way, fully describing the characteristics of the sample and critically reflecting on the limits of the sample (→ section 4.3.1, 4.3.2 and 8.1);
- suggesting further implications for additional research and applications of the results of the study (→ chapter 8 and 9).

Utilization

Miles et al. (2014, pp. 314) point out that, although a study may meet the quality criteria outlined above, the question remains as to the value of the study for the persons involved, i.e. the participants and the researcher(s), as well as the readers (ibid.). A critical ethnographic approach, as applied in this study, aims at eliciting practical, constructive actions (ibid.). "At the very least, they heighten awareness among participants of selected social issues that affect them directly" (ibid.). Following Miles et al.'s suggestions (ibid., p. 315), this thesis aims to ensure utilizability by:

- being transparent with ethical concerns and mentioning the underlying values, paradigms and assumptions of the field situations (→ section 4.3).
- aiming to make the findings beneficial for the people involved, making findings accessible to participants, potential readers and other researchers (→ follow-up).
- ensuring that the topic and results of this study enable a global and specific understanding of action orientation and its political dimensions (→ chapters 8 and 9).

4.6 Display of the data

The remaining research questions (RQ3-RQ5) as indicated in section 4.2 will be addressed in the following three chapters, 5-7. Consequently, the chapters are named *knowledge elements* (chapter 5), *competency components* (6) and *pedagogical approaches* (7).

Each of the three chapters begins with the theories relevant to the respective question on, for instance, knowledge elements in ESD. Throughout the next three chapters, various contributions by authors of the critical ESD community are included, as well as two very recent documents that are included for purposes of comparison. The first is by UNESCO ("Education for Sustainable Development Goals", 2017a) and the second by the OECD ("The OECD PISA global competence framework", 2018). It must be noted, however, that the impact of these two contributions on the ESD community is still up to debate. Especially the global competence framework does not come from within the ESD community but is rather a related concept in the way that it builds on the same political grounds as does ESD (see OECD 2018, p. 5; 10).

Afterwards, the empirical results pertaining to the respective question will be displayed, including some examples from the data to emphasize the central findings. Each of these three chapters ends with a brief discussion of the respective research question by identifying the differences and overlaps between the theoretical and empirical perspectives. As a result, parts of the discussions are pre-displayed in chapters 5-7 before arriving at the overall discussion in chapter 8.

It is important to mention that the results are not displayed according to the codes, but rather the category structure of the data analysis. As showed in the methods section (4.4), the deductive-inductive analysis led to codes of knowledge and topics, competency components, and pedagogical approaches that were integrated into triangulated meta-categories of both case studies and experts (see section 4.4.1). However, due to the complexity of the resulting set of categories, the presentation of the results in chapters 5-7 is restricted to the core findings that are relevant for the discussion. Selected quotes ('anchoring quotes') have been altered for the sake of grammatical consistency and readability. The semantic content in each case remains unchanged, however. These quotes are included only to highlight the most important aspects of the results. All quotations were translated by the author. Along with the display of the summarized empirical findings, footnotes provide indications to the relevant underlying transcript and refer to the respective triangulated meta-category.

In line with this thesis' critical ethnographic approach, the process of data collection is open to important 'side-events' and is able to contextualize them within the study as a whole (see LeCompte & Schensul, 2010, p. 56). The inclusion of some non-systematic results is legitimized by this approach.

Therefore, selected non-systematic contributions by the experts have been added to the overall discussion of this thesis in chapter 8.

Data examples from both research units are displayed in a balanced manner. However, in some cases there is a stronger emphasis on examples from the experts' data, because triangulation was not possible. The examples from the case studies include both examples from cases of exploration and from contrasting cases. The overall meaning and added value of contrasting cases for this study is further discussed in the methods reflection in chapter 8.1.

5 Knowledge elements

This chapter on knowledge elements introduces the theoretical perspectives of both the critical community and the 'mainstream' ESD community (5.1), as well as practical educational perspectives derived from the data body of the empirical study of this thesis (5.2). Both the theoretical and practical perspectives prepare the ground for a subsequent discussion (5.3) of the third research question: which knowledge elements from the degrowth-informed educational practice should be integrated in ESD?

5.1 Theoretical perspectives on knowledge elements

Chapter 5 and 6 look at knowledge elements and competency components separately. However, from the outset it should be mentioned that there is, of course, much overlap between the two. This thesis considers the possession of specific knowledge to be a qualified ability, in contrast to competencies, which are qualified applications of knowledge (see UNESCO, 2015, p. 79, see Fig. 12).

Chapter 6 will introduce the competency debate in detail (see more in the beginning of chapter 6). However, it is worth briefly pointing out how the two are related. Competencies "enhance the ability to use the appropriate knowledge" (UNESCO, 2015, p. 41). That is to say, competencies and knowledge augment one another. The various ways of applying knowledge are captured in the UNESCO figure 12 below:

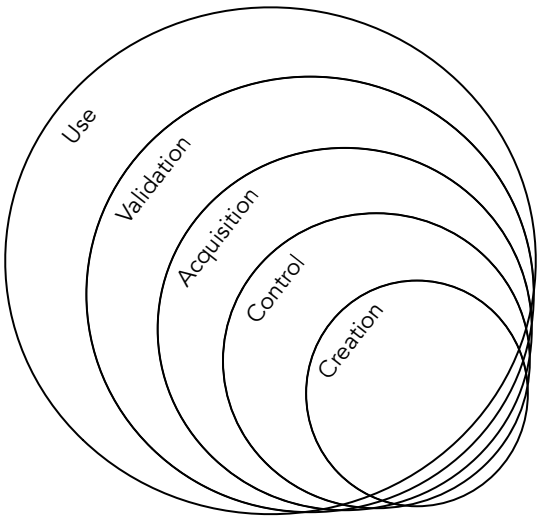

Fig. 12: "Knowledge creation, control, acquisition, validation and use" (adapted from UNESCO, 2015, p. 79).

The UNESCO figure above shows how the "creation, control, acquisition, validation and use" (ibid.) of knowledge are related to one another. This is useful for understanding how knowledge functions in educational processes.

'Creation' is the starting point for deliberate learning (*i.e.*, education) but it has a limited scope – as the small inner circle representing it indicates. As is shown in the concentric circles surrounding 'creation', the learners must then gain 'control' over this newly created knowledge, before they can properly 'acquire', and then 'validate' it. Finally, the outermost circle – that which has the widest scope – represents a competent 'use' of such knowledge.

Challenges of defining knowledge elements in ESD

Selecting a fixed catalogue of knowledge elements in ESD is challenging for a variety of reasons. One issue is the manner in which knowledge is dictated by its cultural and social context (Schneider, 2013, p. 10). Setting a fixed canon of knowledge for ESD necessarily privileges certain forms of – often decontextualized – knowledge production over other, more localized, context-specific knowledge forms. This has the potential to be very problematic for learners in less privileged, globalized settings, as well as those not belonging to the dominant social or cultural group in their learning context. This makes it almost impossible to define a fixed canon of knowledge for ESD globally. Consequently, most authors and official publications stick to defining certain domains of knowledge that relate to sustainability instead of setting out a fixed canon of topics.

ESD author de Haan suggests certain *criteria* for the selection of knowledge elements. According to de Haan, a knowledge element should be a "central local and/or global topic for SD" of "long-term significance" that equips the learners with "differentiated knowledge" and the "discretion to act" (de Haan, 2002, pp. 16, my translation).

Such criteria are likely to rely on their respective underlying conceptions of sustainability as their guiding principle. "The development and use of knowledge are the ultimate purposes of education, guided by principles of the type of society to which we aspire" (UNESCO, 2015, p. 79)." Therefore, if we 'aspire' to be a degrowth society, our choice of which knowledge elements to focus on is likely to be different than that of a growth society.

Classifications of knowledge elements along sustainability models

This section introduces some examples of how to define knowledge elements in line with the differing conceptions of sustainability discussed in section 2.2.2. For instance, de Haan suggests – in the same early ESD publication that included the abovementioned *criteria* for the selection of knowledge elements – that key themes and contents for ESD could be structured along the three dimensions of sustainability: ecology, economy and society (de Haan, 2002, pp. 17).

In the ecological dimension, there is a strong focus on *analytic* aspects (ibid., p. 20). Some examples of knowledge elements pertaining to this dimension include ecosystem change, resource exploitation and carbon sinks (ibid., p. 17). In the economic dimension, the focus is more on action-oriented aspects. Knowledge elements corresponding to this dimension are, for instance, criteria for growth, production, trade and distribution, consumption, prices, debts and taxes (ibid., p. 18). Lastly, the social dimension focuses on elements such as justice, acceptance of responsibility, 'sufficient' lifestyles and cultural adaptability (ibid., p. 19).

Another way of classifying knowledge elements is exemplified by the Swiss educational agency 'éducation21'. Their model of sustainability includes five core dimensions, in the hope of ensuring a holistic view and enabling discussions of the interplay between these dimensions. The first three – society (individual and collective), environment (natural resources), economy (viable processes) – are commonly referred to – but are augmented by the addition of space (local and global) and time (yesterday, today, tomorrow) (Gersbach, 2016, p. 5; see also *éducation21*, no date).

Critical authors have long acknowledged such interrelations and interdependencies. ESD researcher Ute Stoltenberg (2009, originally Stoltenberg & Michelsen, 1999) proposes rather a four-dimensional model. This model is not primarily intended for the classification or selection topics in the context of ESD, although this is one potential application (Stoltenberg, 2009, p. 38).

In this four-dimensional model of sustainability, not only economic, social, and ecological, but also cultural dimensions (Stoltenberg & Michelsen, 1999) are distinguished. This model enables the categorization of a variety of phenomena relating to sustainability, as well as their interconnections and conflicting interests (Stoltenberg, 2009, p. 36). These four dimensions contain, for instance:

- Economic dimension: Means of production and distribution including the organization of labor.
- Ecological dimension: Respect for the natural foundation and conscious guarding of Earth's biodiversity and resources.
- Social dimension: Issues of distributive and intragenerational justice and social cohesion.
- Cultural dimension: Cultural forms of expression, patterns of behavior and symbolic practices and the processual dynamics of culture (ibid., pp. 36).

Stoltenberg emphasizes that in these dimensions, the different spheres of life and social organization mutually influence each other (ibid., p. 38). Economics is one field in which Stoltenberg's model can be concretely applied. She suggests that the model could, for instance, help learners to challenge received

ideas about the economy in relation to underlying power structures (ibid, p. 36) and can help learners to think about taking action in the context of SD (ibid.). The four-dimensional approach gives Stoltenberg's model an interesting perspective from which to consider degrowth because it takes into account the underlying issues of cultures and their interconnection to the other dimensions (Stoltenberg, 2009, pp. 37).

Classification of knowledge elements along global competence and the SDGs

The 'OECD global competence framework' is one of the documents used for the purpose of comparison in chapter 5-7. Knowledge is one of the "building blocks" of the competency framework (OECD, 2018, pp. 12). The underlying classification of knowledge domains exceeds the usual boundaries of sustainability dimensions:

1. **"[C]ulture and intercultural relations** [-] languages, arts, knowledge traditions, norms."(ibid., p. 13)
2. "**[S]ocio-economic development and interdependence** [-] development patterns in different regions of the world, with a focus on the links and interdependences between societies and economies." (ibid.)
3. "**Environmental sustainability** [-] complex systems and policies surrounding demand and use of natural resources." (ibid.)
4. "[F]ormal and informal **institutions** that support peaceful relationships and fundamental human rights." (ibid., p. 13, highlighting in original)

The framework treats aspects of culture as one wholly separate dimension, sees social and economic relations as interdependent and includes the role of the institutions in the framework.

The other publication used as a basis for comparison in chapters 5-7 is "Education for Sustainable Development Goals" (UNESCO, 2017a) which attempts to classify knowledge elements in ESD according to the 17 SDGs (see Fig. 13).

Fig 13: 17 Sustainable Development Goals (Figure from UN, 2018, https://www.un.org/sustainabledevelopment/news/communications-material/)

There is a dizzying number of learning objectives taking place at the cognitive, socio-emotional and behavioral levels named alongside each of the SDGs. Furthermore, around ten specific topic-clusters and an equal number of concrete learning approaches and methods are suggested. Due to the sheer number of topics, they cannot be named in detail here, but Rieckmann (2018) identifies four key themes for ESD throughout the 17 SDGs. These are: "climate change", "biodiversity", "sustainable production and consumption" and "reduction of poverty" (Rieckmann, 2018, p. 82).

The authors of the UNESCO publication seem to be aware of the controversies of economic growth. They suggest that "[e]ducation that promotes economic growth alone may well also lead to an increase in unsustainable consumption patterns" (UNESCO, 2017a, p. 7). However, rhetoric aside, the SDGs do precisely that, raising questions about their overall usefulness. The eighth SDG, for instance, "Decent Work and Economic Growth" (UNESCO 2017a, p. 27), is unapologetically in favor of the growth paradigm.

The degrowth debate therefore considers the defining of learning objectives informed by SDGs that are in favor of growth to be problematic. However, in the UNESCO publication, suggestions for SDG 8 include progressive topics in the context of growth, such as "[a]lternative economic models and indicators: steady-state economies, common-welfare economies, degrowth, subsistence economies, Inclusive Wealth Index and Global Hunger Index" (UNESCO 2017a, p. 27).

Although the publication does include progressive and even critical perspectives, including that of degrowth, on alternative economies, they are surrounded by knowledge elements and learning objectives that promote continuous economic growth. The following 'cognitive' learning objective is a good example illustrating the contradictions that result if knowledge domains are simply informed by the SDGs:

> *"5. The learner understands how innovation, entrepreneurship and new job creation can contribute to decent work and a sustainability-driven economy and to the decoupling of economic growth from the impacts of natural hazards and environmental degradation."* *(ibid.)*

This learning objective exemplifies the underlying assumption of a green economy based on the idea of decoupling. Degrowth rejects this idea of decoupling whole-heartedly as explained in section 2.2.4: Without fundamental and systemic changes, "innovation, entrepreneurship and new job creation" (ibid.) will by no means contribute to decoupling economic growth from environmental exploitation, but rather lead to further resource depletion and rebound effects. And this is only on the technical level. On the level of the social imaginary, the belief that technical innovation and further growth will 'somehow' lead to decoupling is highly problematic because it strengthens the hegemony of economic growth and amplifies the operating modes of the economic system that has itself caused unsustainability.

Degrowth is mentioned again in the knowledge suggestions accompanying SDG 12, "Responsible Consumption and Production" (ibid., p. 35): "Green economy (cradle-to-cradle, circular economy, green growth, degrowth)" (ibid., p. 35). However, degrowth is misunderstood when it is subsumed as one topic among others of a "green economy". Positing 'degrowth' as one topic of a learning process among others that implicitly or explicitly promote the continuity of economic growth is inherently contradictory. Chapter 3 pointed out how contradictions in ESD give rise to cognitive dissonances, which in turn hamper ESD's contribution to 'strong' sustainability.

The manner in which the 17 SDGs are usually presented – as if they were all of equal importance to sustainability – is also extremely problematic. Critical authors (e.g. Griggs et al., 2013; Niebert, 2017) have suggested how the SDGs could be restructured and reframed in a hierarchy of importance in line with a 'strong' conception of sustainability. Niebert (2017; 2018, p. 62) suggests that doing so – using a 'nested' conception of sustainability (see Fig. 3c) – could clarify priorities for the political agenda of sustainability, and also for the political dimension of ESD. For ESD as well as degrowth, social and ecological goals ought to be of higher importance than the economic goals.

Knowledge elements in relation to 'strong' sustainability

The following section introduces selected contributions by critical authors that relate knowledge elements to 'strong' sustainability, which is the default position on sustainability in both critical ESD and degrowth. These are first of all outlined in chronological order, and then discussed in relation to one another in the latter part of the section.

Huckle suggested one of the earliest critical classifications of knowledge elements in the ESD debate. Based on Critical Theory, he defines nine components (Huckle, 1991, pp. 55) as follows:

> *"1. Knowledge of the natural environment and its potential for human use; 2. Grasp of appropriate technology; 3. Historical knowledge of social formations; 4. Awareness of class conflict and social movements; 5. Political literacy; 6. Awareness of alternative social and environmental futures and the political strategies whereby they are likely to be realized; 7. Understanding of ideology and consumerism; 8. Involvement in real issues; 9. Tentativeness and optimism"*
> *(Huckle, 1991, pp. 55)*

Sterling suggests an alternative 'curriculum' of ESD that, for him, depends heavily on the structures of the educational institutions in which it is taught. Although he outlines a curriculum, he emphasizes that "process is more important than content, and the relation between areas more important than decontextualized studies" (Sterling, 1996, p. 36). The full list of knowledge elements that build on the idea of 'strong' sustainability includes:

> *"political education and political ecology; natural history; environmental science; ecology and biodiversity; system-theory and systemic thinking; social relations; conflict resolution; equity and social justice; local and bioregional studies and local distinctiveness; community building and citizenship; global environment and development issues; transpersonal ethics; cultural studies including southern, indigenous and traditional views; ecological design including aesthetics; permaculture and sustainable systems; new economics; humanistic psychology and interpersonal relationships; health and the environment; modernity, science and technology; futures studies; and practical capabilities in the abovementioned of areas"*
> *(ibid.)*

Fien suggests that there are five domains of knowledge elements that deal with the interrelation of culture and economy as well as the underlying power structures of societies. They are: "[e]conomic production"; "[d]istribution and redistribution"; "[p]ower and decision making"; "[s]ocial organization"; and "[c]ulture and ideology" (Fien, 2004, pp. 94). In addition to this classification, he also suggests specific topics for the integration of ESD into Australian curricula (Fien 2001, pp. 19). For instance:

> *"Interdependence; Biodiversity; Interspecies equity; Carrying capacity; Steady-state economy; Ecospace; Ecological footprint; Sustainable production; Sustainable consumption; Eco-efficiency; Lifecycle analysis; Natural resource accounting; The 5 R's (reduce, reuse,*

renew, recycle, rethink); Local-global links; Intergenerational equity; Human rights; Basic human needs; Media literacy; Democracy; Precautionary principle" (ibid.)

These knowledge elements are clearly growth-critical and revolve around the interrelation of economic and social phenomena. For Fien, this interrelation is fundamental to how learning should be considered and structured. It should be holistic, founded upon a moral base, and it must be interdisciplinary (ibid., pp. 91).

David Orr asserts that no single learner should leave any educational institution without at least a basic comprehension of certain crucial knowledge elements (Orr, 2004, p. 14) that support growth criticism and the theme of strong sustainability, such as:

"the laws of thermodynamics; the basic principles of ecology; carrying capacity; energetics; least-cost, end-use analysis; limits of technology; appropriate scale; sustainable agriculture and forestry; steady-state economics, and; environmental ethics" (ibid.14)

The different suggestions for knowledge elements in the context of 'strong' sustainability are often informed by critical categories drawn from Critical Theory or political economy. It is not possible to directly compare the abovementioned authors' lists because they were not all created with the same purpose in mind. While some authors' works remain rather abstract (e.g. Huckle, 1991; Sterling, 1996), others give very specific examples of topics (Fien; 2001; Orr 2004).

The contributions of critical ESD can hardly be compared in a systematic review because in most publications, the authors state that they are not being exhaustive. However, in synthesis, there seems to be some recurring and unifying knowledge elements, such as:

- History and culture (*e.g.* the historical roots of culture; natural history; ideology; consumerism; indigenous and traditional views)
- Political issues (*e.g.* class conflict; social movements; political ecology; democracy; citizenship)
- Social organization (*e.g.* alternative forms of organization; social relations; conflict resolution; equity; justice)
- Economy (*e.g.* steady-state economy; sustainable production; 'the five Rs'[134]; new economics)
- Environment and resources (*e.g.* ecology; biodiversity; carrying capacity; laws of thermodynamics; energetics; sustainable agriculture and forestry)
- Technology (*e.g.* the critical consideration of its role; media; limits of technology)

[134] Reduce, reuse, renew, recycle, rethink

However, each attempt to simplify or classify these knowledge elements paradoxically results in yet another list that is in no way definitive. This 'trap' of specificity may suggest why many authors restrict themselves to suggesting more abstract domains. The usefulness of identifying detailed 'topics' is limited because their complexity is difficult to capture.

5.2 Practical perspectives on knowledge elements

The following section on practical perspectives on knowledge elements presents the relevant empirical results, organized into analytical categories, in a condensed manner (see section 4.6 for an explanation of the display of data). For the sake of readability, only selected data examples ('anchoring quotes') will be included, and most of the examples will be referred to in the form of footnotes. Each footnote refers to the sections of the data transcripts that refer to a direct or indirect quotation. This has been done to ensure the validity of the overall study. In the following paragraphs, the opinions and responses of both the experts and the cases studies will be presented. The positions presented here are not without controversies among the research units but due to reasons of anonymity, the opinions of the groups in question will be presented in a unified manner.

5.2.1 Symptoms of unsustainability

In this section, the dimension *symptoms of unsustainability* will be presented. Here both the experts and the case studies refer to a variety of global issues of which learners ought to be aware, such as the exceeding of biophysical and social boundaries, as well as ecological and social exploitation resulting from economic processes.

The limits and consequences of economic growth[135]

This category focuses on knowledge of the symptoms of unsustainability caused by economic growth - the limits to growth in general and the negative effects of economic growth on the socio-ecological system in particular – and how the acquisition of that knowledge can benefit learners. This analytical category is concerned with knowledge of the ecological limits of the planet's natural systems as well as those limits' relationship to exploitation. Only the experts' data was used in this category, making triangulation impossible (see methods reflection, section 8.1).

With regard to the negative effects of economic growth[136], the experts specify that knowledge of the very existence of ecological limits[137] is a precondition to learners' understanding the harmfulness of economic growth in both a social and ecological regard. Furthermore, they suggest that learners should be aware that, until now, most economic growth has been financed on credit, and that endless economic growth is impossible.[138] Furthermore, they stress that

[135] This category (A1) consists of the following codes: E_A1.1_Negative effects of economic growth and limits to growth; E_A1.2_Ecological limits and exploitation
[136] E_A1.1: Experts_1: 204
[137] E_A1.1: Experts_4: 2
[138] E_A1.1: Experts_1: 74

learners should understand how growth can only be generated through ecological and social exploitation.[139]

"Learners require knowledge that the biophysical boundaries exist. And also that social boundaries exist… but that the biophysical boundaries are simply non-negotiable."
(E_A1.2: Experts_1: 20)

An illustrative example of this 'non-negotiability' of biophysical boundaries might be, for instance, energy sources, which are either depleted or not.[140] Oil can only be burned once.

In sum, the key knowledge elements for learners from the degrowth-informed educational practice in this category are as follows:

- The social and ecological effects of economic growth
- The consequences of reaching the biophysical limits to economic growth
- The consequences of reaching the social limits to economic growth
- The problems caused by the financing of growth through credit

Global socio-ecological problems[141]

In contrast to the previous category, which dealt specifically with knowledge elements concerned with the limits and consequences of economic growth as a symptom to unsustainability, the category *global socio-ecological problems* suggests knowledge elements that can help learners to understand the symptoms of unsustainability on a broader level. Unlike the previous category, this category builds on the data of both experts and case studies.

The case studies suggest that learners knowledge of socio-ecological problems[142] - is a precondition for the development of further, more detailed knowledge on the symptoms of unsustainability and as a first step towards further action or engagement[143]. More detailed knowledge elements suggest that learners should know about resource depletion[144] and the facts and figures of climate change - suggested by both case studies[145] and experts[146].

"Learners should know about the effects and prospects for the next 200 or 20, 30 years if we continue on unsustainable pathways. For instance, that the resources for this year have already been overshot."
(CS_A2.1: Jordan_2: 143)

[139] E_A1.1: Experts_1: 74-79
[140] E_A1.2: Experts_1: 20
[141] This category (A2) consists of the following codes: CS_A2.1_Global problems/unsustainability; E_A2.1_Social injustice and inequalities; CS_A2.2_Climate change; E_A2.2_Climate change
[142] CS_A2.1: Chris_1, 62; CS_A2.1: Alexis_1, 64;
[143] CS_A2.1: Noor_1: 32
[144] CS_A2.1: Jordan_2: 144
[145] CS_A2.2: Pip_1: 64
[146] E_A2.2: Experts_1: 73

The case study participant in the quote above suggests that learners should know about future problems that will be caused by continuous resource depletion, including a reference to the 'earth overshoot day' that dates the day of the year when the natural resources available for a year are exceeded by humanity's consumption of resource for that year.

The experts furthermore suggest that learners should know about issues of social injustice and inequalities in the distribution of resources globally[147] and about the link of these issues to economic growth and our own lifestyles in the Global North[148].

In sum, key knowledge elements for learners from degrowth and educational practice in this category are as follows:

- Climate change
- Unsustainability
- Resource depletion
- Global inequality
- Exploitation of the Global South by the Global North

5.2.2 Causes of unsustainability and barriers to sustainability

In this section, knowledge elements pertaining to the dimension of *causes of unsustainability and barriers to sustainability* will be presented. The experts and the case studies named several knowledge elements in this dimension that the learners should posses: growth paradigm, capitalism and the economic system, as well as culture and the social imaginary.

Growth paradigm[149]

This category centers around knowledge of the growth paradigm's role in both causing unsustainability and acting as a barrier to sustainability. The growth paradigm in one's own life and the links to one's own life as a knowledge element of which learners ought to be aware of were especially mentioned by the case studies. The experts, by contrast, referred to more specific, descriptive knowledge elements, such as green growth, GDP, etc.

According to the case studies, examples of knowledge elements for the imprint of the logic of growth on all spheres of life for the learners include how the acceleration, accumulation and use of resources[150] have become nearly

[147] E_A2.1: Experts_1: 61

[148] E_A2.1: Experts_1: 198; E_A2.1: Experts_Synthesis: 33

[149] This category (B1) consists of the following codes: CS_B1.1_Growth paradigm in all spheres of life; CS_B1.2_Links between growth, unsustainability and personal life; E_B1.1_Growth compulsion and drivers; E_B1.2_Function and significance of GDP; E_B1.3_Political decisions in favor of growth; E_B1.4_Green growth, decoupling, rebounds, weak sustainability

[150] CS_B1.2: Jordan_2: 143

universal principles[151]. Furthermore, the case studies suggest that learners should be aware of how such principles are linked to one's own life, as well as the ways in which one contributes to keeping such principles alive[152].

Aside from the knowledge elements relating to one's personal life, which the case studies tend to emphasize, the experts proffer some more specific topics that relate to the function of growth within the economy and the economic mechanisms of the growth paradigm. These include the function and significance of GDP[153], growth compulsions and drivers as economic mechanisms,[154] as well as the operating modes of the interest system[155]. They connect the knowledge of systemic causes of growth to the idea that growth itself is a barrier to both sustainability and system change*:*

> *"Learners should know that in a system based on interest, we will not be able to break free from the growth system. Take the baker who does not even want to grow - but simply needs to buy a new oven – if he borrows money from the bank, he needs to pay higher interest rates than he actually paid for the oven."*
> *(E_B1.1: Experts_1: 18)*

The experts furthermore suggest that learners should know about unsustainable political decisions that lead to social and ecological costs in the form of negative externalities and how they support unsustainable consumption choices and continuous economic growth.[156]

The experts also suggest that learners ought to acquire knowledge of economic 'myths' and 'green promises'. These support the flawed idea that little adjustments within the existing economic system will lead to sustainability while avoiding system change.[157] Further knowledge elements in this arena include ideas such as 'weak' sustainability[158], decoupling green growth and rebound effects.[159]

In sum, key knowledge elements for learners from the degrowth-informed educational practice in this category are as follows:

- The growth paradigm
- The significance of the GDP in the economy
- Growth compulsions and drivers
- The interest system
- Unsustainable political decisions
- 'Weak' sustainability, green growth and the problem of decoupling

[151] CS_B1.1: Pip_2: 36
[152] CS_B1.2: Chris_1: 76-70
[153] E_B1.2: Experts_1: 196
[154] E_B1.1: Experts_1: 196
[155] E_B1.1: Experts_1: 18
[156] E_B1.3: Experts_1: 16
[157] E_B1.4: Experts_1: 52-54
[158] E_B1.4: Experts_1: 70-72
[159] E_B1.4: Experts_1: 55-57

- Rebound effects
- The imprint of economic growth on one's personal life

Capitalism and the economic system[160]

This category focuses on knowledge elements pertaining to capitalism and the economic system. Both research units – experts and case studies – suggested that learners should obtain a basic knowledge of the operating modes of capitalism[161] and the economic system[162] as both causes of unsustainability and barriers to sustainability.[163]

"Learners should have a bit of systemic knowledge, such as 'how does capitalism work?' And where are connecting factors, where we can somehow change our capitalist system?"
(CS_B2.2: Vanja_1: 98)

Next to this fundamental knowledge of capitalism, the case studies suggest that learners should have a basic comprehension of the financial system.[164] Interestingly, both the experts and the case studies connected systemic knowledge for the learners to knowledge elements of system change,[165] which will be discussed in further detail in the next section, on 'change and strategies'.

Other knowledge elements for the learners in this category are the embeddedness of the economic system in its historical background[166], social institutions, rules and power structures[167] and how they are linked to social and economic behavior[168].

In this category, the experts also highlight the need for learners to know about their local context – knowledge elements such as ecological subsystems, the municipal political context and its contemporary debates, local stakeholders, and institutions. These play a crucial role for degrowth.[169]

In sum, key knowledge elements for learners from the degrowth-informed educational practice in this category are as follows:

- Operating modes of capitalism
- Operating modes of the economic system
- Operating modes of the financial system
- Historical embeddedness of the economic system

[160] This category (B2) consists of the following codes: E_B2.1_Basic conception of social system (economical & political); CS_B2.1_Basic conception of economic and financial system; E_B2.2_Conception of local social and political system; E_B2.3_Historical-economic background; E_B2.4_Operating modes of capitalism; CS_B2.2_Operating modes of capitalism; E_B2.5_Institutions, rules and power structures
[161] E_B2.4: Experts_1: Paper note
[162] CS_B2.1: Blair_1: 64; 66
[163] E_B2.1: Experts_1: 12-14
[164] CS_B2.1: Alexis_2: 43
[165] E_B2.1: Experts_1: 153-155
[166] E_B2.3: Experts_1: 157-158
[167] E_B2.5: Experts_1: 165
[168] E_B2.5: Experts_1: 162-164
[169] E_B2.2: Experts_1: 166-170

- Economic function of institutions, rules and power structures
- Local economic systems and stakeholders
- Local political context and its debates

Social imaginary and culture[170]

This category comprises knowledge elements of culture and the social imaginary that are determined by economic growth and are therefore a cause of unsustainability as well as functioning as barriers to sustainability. All the contributions in this instance were taken from the experts' data. Triangulation was not possible in this category (see methods reflection, section 8.1).

In the previous category on capitalism and the economic system, the experts suggested that learners should know how institutions, rules and power structures are linked to the economic behavior of individuals. Similarly, in this category, they suggest that learners ought to be aware of the mutually constitutive relationship between the social and economic order and the social imaginary.

"Learners should know about the effects of different rules and institutions on the actions of people. This is for instance represented in game theory with the egoistic rational man. It is about how institutions generate egoism or not…"
(E_B3.3: Experts_1: 162-165)

The quote above indicates how the experts suggest that the operating modes of the economic system shape the dominant 'idea of man'. They furthermore suggest that learners should know for instance how the picture of 'homo economicus' is grounded in the culture and logic of economic growth.[171]

The experts also suggest that learners should know how our consumption decisions and patterns are directed by market- and advertising mechanisms.[172] Examples of knowledge elements include market values such as 'more is better than less' or 'growth is good' and that they are strongly imprinted in the social imaginary.[173] The experts furthermore point out that learners should also know how such values, symbols[174] or images are harmful because they prevent system change[175] and are thus a barrier to sustainability.

They should also know how the contrasting pair of the two values, competition and cooperation[176], influences the social imaginary, and that a focus on either one of the two has psychological effects. Those effects, that learners should also know about are for instance "alienation from things and objects that

[170] This category (B3) consists of the following codes: E_B3.1_Influence of symbols on human action; E_B3.2_Imprint of market values on consumption & social imaginary; E_B3.3_Homo economicus in historical-cultural background; E_B3.4_Competition vs. cooperation; E_B3.5_Alienation; E_B3.6_Human-nature relationship; E_B3.7_Social imaginary as barrier to system change
[171] E_B3.3: Experts_1: 63
[172] E_B3.2: Experts_1: 16
[173] E_B3.2: Experts_1: 23-24
[174] E_B3.1: Experts_1: 165
[175] E_B3.7: Experts_1: 20
[176] E_B3.4: Experts_1: 215

we possess"[177] or the lack of connectedness to nature in human psychology and in the human-nature-relationship[178].

In sum, key knowledge elements for learners from the degrowth-informed educational practice in this category are as follows:

- Interdependencies between economic order and the social imaginary
- Interdependencies between economic order and 'idea of man'
- Direction of consumption patterns by market mechanisms
- Imprint of market values, symbols and images on the social imaginary
- Psychological effects of market values, such as alienation

5.2.3 Change and strategies towards sustainability

In this section, knowledge elements that relate to the dimension *change and strategies towards sustainability* are presented. Knowledge elements in this dimension that learners should know about include justice, alternative and collective models of social and economic organization and system change.

Literacy for justice[179]

In this category, knowledge elements are suggested only very occasionally by case studies and experts (see methods reflection in section 8.1). However, both research units suggest that learners ought to be aware of aspects of global interconnections, responsibility and justice, as well as redistribution.

As suggested earlier in the category *global socio-ecological problems*, the case studies suggested that learners should know how their personal life and consumption of people in the Global North is connected to injustices in other parts of the world, especially the Global South. In this category, the case studies suggest that if learners knew about responsible consumption – it would be a starting point for also knowing about the potential of responsible consumption for intergenerational justice.[180] Not only inter- but also intragenerational justice and the prospect for future symptoms are considered by the case studies to be an important knowledge element that learners should be aware of.[181] Knowing about inter- *and* intragenerational justice is also suggested by the experts.[182] Such suggested *literacy for justice* also reaches out to conceptions of distributive justice and the redistribution of resources: The experts consider such knowledge as potential strategic knowledge towards sustainability.[183]

[177] E_B3.5: Experts_2: 163
[178] E_B3.6: Experts_1: 177
[179] This category (C1) consists of the following codes: CS_C1.1_Global interconnections, responsibility and justice; E_C1.1_Justice and redistribution
[180] CS_C1.1: Chris_1: 42
[181] CS_C1.1: Chris_1: 90
[182] E_C1.1: Experts_1: Paper note
[183] E_C1.1: Experts_1: 61

More detailed examples of knowledge elements in this category include human rights[184] and the historical roots of unsustainability in colonialism. The case studies suggest that if learners know about aspects such as post-colonial theories, they can develop different perspectives and worldviews[185], which can be the starting point for individual and societal change processes.

In sum, key knowledge elements for learners from degrowth and educational practice in this category are as follows:

- Intergenerational/distributive justice
- Intragenerational justice
- Human rights
- Post-colonial theories

Alternative individual and collective models[186]

In this category that was highly frequented by both, case studies and experts, knowledge elements of alternative conceptions of individual and collective (economic) organization and 'utopias' such as concrete projects of socio-ecological transformation are suggested for the learners.

Specific knowledge elements that were suggested by the experts for the learners encompass transformative economies and lifestyles in concept and practice[187], including modes of alternative socio-economic organization[188] such as alternative currencies, alternative lifestyles[189] including alternative concepts of 'good life'[190], gardening projects, repair cafés[191]. They see the advantage of such 'lived alternatives' in their direct inspiration for the learners because they become aware the many pioneers already exist. [192] The experts also suggest that such knowledge is precondition for developing skills to implement change in a subsequent step after the learners acquired such knowledge.

The case studies also suggest that learners should know about successful projects that already had an impact on society because they consider such knowledge as especially motivating.[193] The experts consider such elements to be personal and strategic knowledge[194] for the learners that is crucial for a degrowth society:

[184] CS_C1.1: Noor_1: 50
[185] CS_C1.1: Vanja_1: 80
[186] This category (C2) consists of the following codes: E_C2.1_Conception/imagination of good life; CS_C2.1_Social and economic utopias; E_C2.2_Social and economic alternatives and utopias; E_C2.3_Transformative economies and lifestyle (practice & concepts); CS_C2.2_Transformative projects and lifestyles; E_C2.4_Influence of individual action
[187] E_C2.3
[188] CS_C2.2: Jordan_2: 123
[189] E_C2.3: Experts_1: 116; CS_C2.2: Tal_1: 12
[190] E_C2.1: Experts_1: 196
[191] E_C2.3: Experts_1: 116
[192] E_C2.3: Experts_1: 205
[193] CS_C2.2: Riley_2: 107
[194] E_C2.1: Experts_1: 61

"If learners are supposed to establish alternative mental infrastructures, then they need to know examples. They need models in concrete places and within such places, they can change their values and guiding principles."
(E_C2.2: Experts_2: 66)

On a broader level the experts also suggest that learners should know about the scope and impact of individual actions within the economy[195] because they consider this to be an important precondition for estimating the influence of either a group of one's own social and economic impact. According to the experts, this applies especially to the influence of individual decisions in the sphere of consumption. If learners know about the impact of individual consumption they can contribute to the economy in an informed way[196]. However, they also emphasize that the learners should know about the limitations of individual (and even collective) consumption because substantive change in the end always depends on political decisions[197].

Therefore, on the more political level, the experts highlight that learners should be aware of *e.g.* initiatives for organizing economies in a sustainable way such as initiatives for unconditional basic income[198] or for alternative approaches of measuring well-being (beyond GDP)[199].

In sum, key knowledge elements for learners from degrowth and educational practice in this category are as follows:

- Collective socio-economic projects and economic alternatives
- Concepts of the 'good life'
- Relative impacts of individual consumption choices
- Political initiatives for organizing economies differently

System change[200]

In this category, the case studies and experts suggest knowledge elements that relate to *system change*. Knowledge elements in this category often also relate to the other two dimensions such as the *symptoms of unsustainability* (section 5.2.1) and the *causes and barriers* (5.2.2).

In this manner, the experts and also the case studies suggest that if learners have a basic knowledge of the *symptoms and causes of unsustainability*, they should also acquire strategic knowledge that system change is necessary[201] *and* possible[202]. One example is that if they know about the operating modes of

[195] E_C2.4: Experts_1: 155-157
[196] E_C2.4: Experts_1: 117
[197] E_C2.4: Experts_1: 16
[198] E_C2.3: Experts_1: 61
[199] E_C2.1: Experts_1: 196
[200] This category (C3) consists of the following codes: E_C3.1_System change is necessary; E_C3.2_System change is possible; CS_C3.1_System change is necessary and possible; E_C3.3_Leverage points and strategies for change; CS_C3.2_Identification of leverage points by knowing the system
[201] E_C3.1: Experts_1: 16-18
[202] E_C3.2: Experts_1: 52; CS_C3.1: Chris_1: 62

the system (see section 5.2.2), such knowledge can function as a starting point for changing the system.[203]

Another knowledge element suggested by the experts is that change is in fact possible – economic systems are not naturally given but instead historically grown and mutable[204]. Related to this, but more on the personal level, the case studies emphasize that learners should know that system change and alternatives are indeed possible and that everybody can contribute in their own way.[205]

Both research units identify knowledge elements of these two fundamental ideas - that system change is both necessary *and* possible - as a precondition for the learners' acquisition of further strategic knowledge of potential leverage points for changing the system.[206] In general terms, the experts suggest that learners should know about different strategies of change[207]. Examples for more specific knowledge elements given by the experts are the potential of degrowth as a counter-project[208], or the personal knowledge of 'how to behave in resistance'[209].

The case studies suggest that learners should know about leverage points because they can build links to action and the changing of the capitalist system[210]. On the other hand, they suggest knowledge of potential leverage points on a personal level:

> *"The learners should know that the system can be changed at every point. Most probably one does not even need to deal with the giant post-growth theories or to try to enter politics. There is something to be changed at every point and on every scale."*
> *(CS_C3.2: Pip_2: 36)*

The above quote indicates that knowledge of potential leverage points for system change is useful on many different scales. The interviewee suggests that s/he believes that knowledge of individual contributions can cumulatively have an impact on a systemic level and contribute to subverting the logic of growth.

In sum, key knowledge elements for learners from degrowth and educational practice in this category are as follows:

- System change is necessary
- System change is possible
- Leverage points on a political level (e.g. degrowth)
- Leverage points on a personal level (e.g. behavioral strategies)

[203] E_C3.3: Experts_1: 12; CS_C3.2: Alexis_2: 43
[204] E_C3.2: Experts_1: 63; E_C3.3: Experts_1: 12
[205] CS_C3.1: Chris_1: 62
[206] E_C3.3: Experts_1: 126; CS_C3.2: Alexis_2: 43
[207] E_C3.3: Experts_1: 207
[208] E_C3.3: Experts_1: 12
[209] E_C3.3: Experts_1: 14
[210] CS_C3.2: Vanja_1: 98

5.3 Discussion of knowledge elements

Whereas section 5.1 introduced knowledge elements from the ESD community that are part of the theoretical discourse, section 5.2 explored a variety of knowledge elements taken from the practical perspectives of degrowth and educational practice. Building on these two perspectives, this section will discuss and draw conclusions to the third research question: 'Which knowledge elements from the degrowth-informed educational practice should be integrated into ESD?'

In the empirical-analytical process, knowledge elements from the degrowth-informed educational practice were classified in the following three dimensions: *symptoms of unsustainability*, *causes of unsustainability and barriers to sustainability*, and *change and strategies towards sustainability*. In the next paragraphs, each of these dimensions, along with their respective categories, will be discussed with reference to ESD (section 5.1) and the degrowth debate (chapter 2).

The first of the two categories contained within the dimension *symptoms of unsustainability - the limits and consequences of economic growth*, goes beyond what most of ESD suggests. It focuses on learners acquiring knowledge of the ways in which the *symptoms of unsustainability* can be traced back to economic growth as their ultimate cause. This is sometimes, but not necessarily the case in ESD (e.g. Fien, 2004; Orr, 2004). The second, much broader category, *global socio-ecological problems*, contains a host of knowledge elements already common in ESD (e.g. Stoltenberg, 2009; UNESCO, 2017a). These include, for instance, broad elements such as 'climate change' and the 'exploitation of the Global South by the Global North'. However, this dimension is mentioned only occasionally by both the experts and the case studies, and is therefore not a major focal point in this discussion.

In the second dimension, *causes of unsustainability and barriers to sustainability*, the categories are explicitly growth-critical (see chapter 2). Specific knowledge elements for the learners in the category *growth paradigm* include connections between the growth paradigm as experienced by the individual and systemic phenomena such as 'the significance of the GDP in the economy', 'growth compulsions and drivers', 'the interest system' and ''weak' sustainability, green growth and the problem of decoupling'. The knowledge elements in this empirical category are more specifically growth-critical and also more detailed and nuanced than those seen in most ESD approaches (see section 5.1 and below).

There are clear contradictions evident between this category and some ESD publications. For example, the results differ from the recent UNESCO publication "Education for Sustainable Development Goals" (UNESCO, 2017a) in that they are strongly growth-critical, despite the UNESCO learning objectives being in parts explicitly in favor of growth, such as SDG 12 (with

the topic of the "green economy", including both, "green growth" *and* "degrowth") (ibid., p. 35) or SDG 8 (with the learning objective of "decoupling of economic growth from […] environmental degradation") (ibid., p. 27). Not only the practical perspectives on knowledge elements (section 5.2), but also the theoretical perspectives of degrowth (chapter 2) vehemently contest the value of such inherently contradictory approaches.

However, there are far more similarities than contradiction between the results and the ESD contributions that were introduced in section 5.1. Some similarities between the empirical results and critical ESD will be described in the following paragraphs. For instance, critical ESD scholar Orr's growth-critical suggestions for a general 'basic comprehension' relates to the empirical results of the category *growth paradigm*. Furthermore, Orr's knowledge elements are mirrored in the theoretical degrowth debate in specific knowledge elements such as "the laws of thermodynamics" and "steady-state economics" (Orr, 2004, o. 14).

In the next category, *capitalism and the economic system*, knowledge elements address the systemic issues that are also important to degrowth. It suggests that knowledge of *e.g.* the 'operating modes of the economic system' and 'operating modes of capitalism' is crucial for learners thinking about and acting within social subsystems, be they local and/or institutional.

This category tallies with the work of critical ESD scholar John Huckle, who suggests knowledge elements such as "historical knowledge of social formations", "class conflict and social movements" and "ideology and consumerism" (1991, pp. 55). These knowledge elements are indeed critical of capitalism and society at large, and thus belong to the category *capitalism and the economic system*.

Capitalism and the economic system also resembles elements of Sterling's curriculum for 'strong' ESD. Examples of overlaps between his curriculum and the results of the knowledge elements from degrowth are, in his words, "political ecology", "system-theory and systemic thinking", "social relations", "equity and social justice", "local and bioregional studies" and "new economics" (Sterling, 1996, p. 36). Both Huckle's and Sterling's examples demonstrate that the critical ESD community itself is engaged in connecting systemic economic knowledge elements with alternative economic solutions.

In the category *social imaginary and culture*, the experts suggest that the learners acquire knowledge of how the growth- and market-oriented social imaginary functions as a *barrier* to both sustainability and system change. All of these categories, as well as the detailed knowledge elements they contain (for instance 'interdependencies between economic order and the social imaginary' and 'imprint of market values, symbols and images on the social imaginary'), are widely discussed in the degrowth discourse, but feature in ESD to only a limited extent.

Many parts of the results also resemble ESD author Stoltenberg's four-dimensional model (2009, originally Stoltenberg & Michelsen, 1999), explained in section 5.1. The model addresses the category *social imaginary and culture*, from the *causes and barriers'* dimension. Moreover, by addressing both the personal and cultural assumptions about the economic system and its related power structures, this model deals with knowledge elements concerning both the personal and structural levels of change processes.

The clearest parallel between critical ESD and this second dimension of knowledge elements - *causes of unsustainability and barriers to sustainability* - is seen in Fien's five domains of knowledge elements. These also relate primarily to systemic issues and the *causes of unsustainability* suggested in the practical perspectives. All of Fien's five points - "[e]conomic production"; "[d]istribution and redistribution"; "[p]ower and decision making"; "[s]ocial organization"; and "[c]ulture and ideology" (Fien, 2004, pp. 94) – contain concepts that relate not only to the practical examples given in section 5.2 but also to systemic concepts inherent to degrowth, such as 'power' and 'ideology'.

In the third empirical dimension, *change and strategies towards sustainability*, two of the three categories, namely *alternative individual and collective models* and *system change*, are also closely tied to the degrowth debate. The first of these focuses on knowledge elements that, although not entirely foreign to ESD, are quite degrowth-specific, such as 'collective socio economic projects and economic alternatives' and 'concepts of a 'good life''. In the category *system change*, learners should acquire knowledge elements that aid strategies for initiating larger change processes, such as 'leverage points on a political level (e.g. degrowth)'. It also thematizes more personal aspects, linking the behavior of the individual to systemic change with examples of knowledge elements such as 'leverage points on a personal level (e.g. behavioral strategies)'. This category is somewhat degrowth-specific, although some aspects are also found in ESD. The final category in this dimension, which features much more in ESD, *literacy for justice* focuses on 'intergenerational/distributive justice' and 'intragenerational justice'. Such knowledge elements are well embedded in the ESD discourse (e.g. Sterling, 1996; de Haan, 2002; Stoltenberg, 2009).

Taken as a whole, the empirical results indicate that the knowledge elements contained in the dimensions *causes and barriers* and *change and strategies* in particular should be integrated into ESD. It is clear from the results that knowledge elements from the degrowth-informed educational practice focus not only on the *symptoms of unsustainability*, but rather directly identify and address its *causes*. Although this focus on *causes* rather than *symptoms* is shared by the more critical sections of the ESD debate, there are clearly still a number of areas in which degrowth can profitably contribute to ESD. The theoretical and methodological parallels between the two serves only to augment, rather than weaken, this idea.

At the end of the theoretical section (5.1), the knowledge elements of *critical* ESD were classified into the following categories: history and culture, political issues, social organization, economy, environment and technology. All of these aspects are (with more or less emphasis) addressed in the practical perspectives of this chapter (5.2). In terms of theoretical contributions, it is not the ESD community as a whole, but rather the *critical* ESD community within it that suggests knowledge elements underpinned by the logic of 'strong' sustainability and a focus on systemic issues, such as the *causes of unsustainability and barriers to sustainability* and *change and strategies towards sustainability*. This is one arena in which critical ESD and degrowth align.

At the beginning of the theoretical section of this chapter (5.1), the challenge of defining a set or catalogue of knowledge elements in times of rapid changes was outlined. Because information changes and emerges at such a rate as to make it impossible to create set syllabi that remain relevant for an extended period, many ESD authors stick to pointing out broader thematic fields, or rather suggest classifications of knowledge elements instead of naming specific ones. However, both the empirical results of this chapter and also the theoretical perspectives of degrowth suggest that this need not be the case. In the degrowth debate, the facts that matter most are not, in fact, continuously changing but are actually very robust: although the *symptoms* and coping strategies may be constantly in flux, the *causes of unsustainability* do not change. Therefore, combined with the results of section 5.2, learners should know about the *causes of unsustainability and barriers to sustainability* (section 5.2.2) and about potential counter-hegemonic *change and strategies* (5.2.3).

Because degrowth is not actually an educational perspective, it does not explicitly suggest conceptual 'models' or classifications of knowledge elements that could be discussed along with this thesis' empirical results. However, there are some aspects of the results whose occurrence may be explained by some degrowth phenomena, ideas and publications that were suggested earlier in this thesis.

For instance, in the third empirical dimension, *change and strategies*, models of collective economic projects and alternatives are suggested as knowledge elements for the learners by both the experts and case studies. This relates to the degrowth debate insofar as the empirical results reflect the multitude of local economic alternatives within the degrowth movement, such as transition initiatives and commons (e.g. Ostrom, 2011; Bollier & Helfrich, 2014).

The empirical results relate also to Paech's concept of post-growth economics (Paech, 2017, p. 478). Some key knowledge elements suggested in section 5.2 that correspond to Paech's ideas are, for instance, 'the problem of decoupling', 'global inequality', and 'growth compulsions and drivers' all of which belong to the dimension *causes of unsustainability and barriers to sustainability*. Paech, for his part, also mentions sufficiency, self-supply and

regional economies (ibid.), which partly correspond to the dimension *change and strategies*.

A transformative perspective (see section 2.4), the penultimate contribution from the degrowth debate relevant for this chapter, suggests that change processes necessarily take place on three different levels simultaneously: the social imaginary, individual and collective practices, as well as the level of structures and institutions. These three levels are the "dimensions" in which socio-ecological transformations take place (Muraca, 2015). Finally, the model of leverage points for changing a system (Meadows, 1999), in its recent application by a group of sustainability researchers (Abson et al., 2017), indicates that change processes can be induced on 'deeper' levels (such as the paradigmatic assumptions of a society) as well as on 'shallower' levels (such as policies).

These ideas are clearly reflected in the empirical data. In the case studies, for instance, knowledge of 'leverage points' is considered to be individual (as in the case studies) and political simultaneously. It is indicated that these 'leverage points' can be induced personally, at every point and on every scale. On the other hand, it is also suggested that learners should know about 'leverage points' on the larger scale (*e.g.* changing the capitalist social system). This corresponds to the assumption that some leverage points are easy to address but are perhaps inefficient, while some others are potentially very efficient, but difficult to access (see Meadows 1999, Abson et al., 2017).

By focusing on knowledge of the *causes of unsustainability and barriers to sustainability* and of *change and strategies towards sustainability,* the degrowth-informed educational practice suggest knowledge elements that, although not foreign to the more critical parts of the ESD discourse, could be extremely beneficial if implemented more widely within ESD. Degrowth, far more than ESD, directly addresses the *causes of unsustainability*, chief among them the unsustainable *growth paradigm*. When such knowledge elements are at the center of the educational practice, they can catalyze change process that connect the individual level of the learners and their *social imaginary* with the systemic demands for socio-ecological transformations.

6 Competency components

This chapter, which focuses on competency components, follows the same structure as the previous chapter on knowledge elements. Thus, it will begin by introducing a selection of relevant theoretical perspectives on competency components from within the ESD discourse (section 6.1), before displaying the results of the empirical part of the thesis, namely the practical perspectives on competency components (6.2). This will be followed by a discussion of both the theoretical and practical perspectives in relation to research question 4: Which competency components from the degrowth-informed educational practice should be integrated in ESD?

6.1 Theoretical perspectives on competency components

The competency debate is one of the largest in ESD in terms of contributions. This is evidenced by the discourse's multitude of different sets and models of competencies, the most relevant of which will be outlined in this section. The development of sustainability-related competencies in learners is often described as one of the central learning outcomes of ESD (UNESCO, 2014c, p. 12). In an influential 2005 publication on competencies, the OECD education ministers claimed that "'[s]ustainable development and social cohesion depend critically on the competencies'" – which encompass "'knowledge, skills, attitudes and values'" (OECD, 2005, p. 4) – "'of all of our population'". It is crucial, therefore, to determine which competencies learners need to develop in order to cope with the challenges of global change (e.g. OECD, 2018; de Haan & Harenberg, 1999; de Haan, 2006; de Kraker et al., 2010, p. 103; Wiek et al., 2011, p. 204; 2015).

There is at present no universally accepted definition of 'competencies' in ESD.[211] In contemporary general educational research, Weinert's understanding of competencies (2001) is often referred to. Weinert outlines the complexity of the competency debate and steers away from giving a concrete definition of competency. Instead, he gives five *pragmatic* conclusions for competencies (Weinert, 2001, pp. 62). First of all, competencies are "prerequisites available to an individual or a group […] for successfully meeting complex demands," (ibid., p. 62) which, secondly, encompass "cognitive and (in many cases) motivational, ethical, volitional and/or social components" (ibid.). Thirdly, Weinert considers the boundaries between the terms 'skill' and 'competencies' to be "fuzzy" (ibid., p. 62). He also argues that competencies can indeed "be

[211] There is no consistency in the educational discourse of whether to prefer the term 'competency', 'competence' or capabilities', in order to describe skills and abilities of learners. In German language, the term '*Kompetenz*' is applied. The competency debate in education evolved to a large extent in the German-speaking discourse and often builds on Noam Chomsky's foundational linguistic definition of 'competence' as "the ability to use linguistic signs to express freely-formed thoughts" (Chomsky, 2000, p. 3). Although the English term 'capability' might actually be the most appropriate one for educational purposes, either 'competency' or 'competence' seems to dominate the discourse. in this thesis, the term 'competency' is applied. Only if demanded by direct quotation or reference to a specific 'model of comeptence', will 'competence' instead of 'competency' be used.

learned but cannot be directly taught" (ibid., p. 63). The final pragmatic conclusion he draws is that key competencies and meta-competencies are quite distinct from one another. Key competencies refer to "master[ing] many different, equally important demands of everyday, work-related, or social life" (ibid., p. 63). Meta-competencies, by contrast, refer only to "declarative or procedural knowledge about one's own competencies" (ibid.).

Weinert's is one of the most complex but also widely accepted descriptions of competencies. Many authors build on his work when considering competencies, also in the context of ESD (e.g. Klieme et al., 2010; UNESCO, 2015, p. 41; UNESCO, 2017a, p. 10). As section 5.1 already explored, it is today, largely due to Weinert's contributions, widely acknowledged among educational researchers that there are many interdependencies between knowledge and competencies. These interdependencies play a crucial role in helping to define competencies for both ESD and the general educational debate. A contemporary definition of competencies is given in the UNESCO report "Rethinking education - Towards a Global Common Good?" (2015) which is key to this study:

> *"Competencies enhance the ability to use the appropriate knowledge (information, understanding, skills and values) creatively and responsibly in given situations to find solutions and establish new ties with others."*
> *(UNESCO, 2015, p. 41)*

Problems and potentials of the competency debate

There are two sides to the competency debate. On the one hand, it is problematic because competencies are regularly instrumentalized for economic purposes, an approach to education that is far from the ideal of *'Bildung'* (see de Haan & Bormann, 2008, p. 9). This is largely a result of measuring the 'productivity' of educational systems in modern industrial societies (Klieme et al., 2008, p. 3) through the use of assessment results (ibid., pp. 10). The implicit rationale of "economic functions of education" (UNESCO, 2015, p. 41) must be considered in a critical manner. The application of such competency research today deals with academic skills and abilities measured by standardized tests, such as PISA. Unsurprisingly, the official perspectives often implemented in formal educational systems contribute significantly to the body of competency literature in the context of ESD (e.g. OECD, 2005; éducation 21, no date).

However, the focus on competencies in education is considered more effective in coping with global problems than isolated, discipline-specific knowledge (see de Kraker et al., 2007, p. 104). From the perspective of mainstream competency researchers, the increasing focus on competencies instead of declarative knowledge has effected a shift in traditional education systems from input-oriented instruction to output and outcome-oriented forms of

learning, i.e. from the explicit teaching of a rigid canon of knowledge (see Klieme et al., 2008, p. 3) to the implicit co-creation of knowledge towards outputs and outcomes orientation in educational systems. This has the potential to be emancipatory and empowering. The critical ESD community emphasizes the potential of competency-based approaches for helping bridge the gap between knowledge and action (e.g. Sterling et al., 2017, p. 160).

Gestaltungskompetenz, Key Competencies, ESD competencies, …

De Haan's and Harenberg's (1999) influential concept of "shaping competence" (German: '*Gestaltungskompetenz'*) (de Haan 2006; 2010) is one of the first elaborated competency concepts in the ESD discourse and a foundation for much of the work that followed. *Gestaltungskompetenz* is defined as follows:

> *"Gestaltungskompetenz means the specific capacity to act and solve problems. Those who possess this competence can help, through active participation, to modify and shape the future of society, and to guide its social, economic, technological and ecological changes along the lines of sustainable development. Gestaltungskompetenz […] means having the skills, competencies and knowledge to change economic, ecological and social behavior without these changes merely being a reaction to existing problems. Gestaltungskompetenz makes an open future possible that can be actively shaped and in which various options exist."*
>
> *(de Haan, 2010, p. 320)*

Gestaltungskompetenz was "designed to reduce the knowledge-action gap and to enhance the acquisition of applicable knowledge" (de Haan, 2010, p. 318). It was also intended to be integrated into formal educational curricula (de Haan, 2010, p. 315). Later versions of the model were oriented along the lines of OECD DeSeCo program[212], which aimed to build a conceptual foundation for "defining and measuring key competencies […] starting from the question of which competencies are important for the prospective personal, economic and societal well-being" (de Haan & Bormann, 2008, p. 9, my translation).

The 12 sub-competencies[213] (de Haan, 2010, p. 320) of *Gestaltungskompetenz* were then categorized according to the three overarching competency domains developed by the OECD DeSeCo program: "interactive use of media

[212] The OECD DeSeCo project ("Definition and Selection of Competencies: Theoretical and Conceptual Foundations") (Rychen & Salganik, 2001; 2003), launched in 1997, influenced a full generation of ESD competency models (e.g. Rieckmann, 2011; 2012; Wiek et al., 2011; education21, 2016). The DeSeCo identified three overarching spheres of competency: interactive use of media and methods, interacting in socially heterogonous groups, acting autonomously (Rychen & Salganik 2001, p. 22; OECD 2005, p. 6). The project had a large-scale impact on the current understanding and focus of the ESD competency debate, as well as approaches to assessments and standardization. Many international competency debates and developed concepts of competencies are orientated along the results of the DeSeCo program.

[213] "*Gestaltungskompetenz* can be split into twelve sub-competencies, namely the ability to: 1. gather knowledge in a spirit of openness to the world, integrating new perspectives; 2. think and act in a forward-looking manner; 3. acquire knowledge and acting in an interdisciplinary manner; 4. deal with incomplete and overly complex information; 5. co-operate in decision-making processes; 6. cope with individual dilemmatic situation of decision-making; 7. participate in collective decision-making processes; 8. motivate oneself as well as others to become active; 9. reflect upon one's own principles and those of others; 10. refer to the idea of equity in decision-making and planning actions; 11. plan and act autonomously; and 12. show empathy for and solidarity with the disadvantaged" (de Haan, 2010, p. 320).

and methods", "interacting in socially heterogonous groups", "acting autonomously" (Rychen & Salganik 2001, p. 22; OECD 2005, p. 6).

Both the DeSeCo conception and *Gestaltungskompetenz* have prompted many to follow in their footsteps in creating competency models for sustainability. Rieckmann (2012), for instance, used empirical evidence to develop a related but different set of 12 '*key competencies for sustainable development'*, especially for the context of higher education. Most important, however, is "systemic thinking and handling of complexity, anticipatory thinking and critical thinking" (ibid., p. 134).

Another example, by a group of US researchers also drew on the idea of *Gestaltungskompetenz* (Wiek et al., 2011, p. 208), and suggests a framework of '*Key Competencies in Sustainability*' (2011; 2015) for higher education institutions. The development was a departure from the tradition of producing long and fragmented "laundry lists" for sustainability competencies (Wiek et al., 2011, p. 204). According to the authors, the key competencies are functionally linked "complexes of knowledge, skills, and attitudes that enable successful task performance and problem solving with respect to real-world sustainability problems, challenges, and opportunities" (ibid., p. 204). In a consolidated version of their key competencies, the authors present a framework of six condensed 'key competencies' that stress values and sustainability-related norms (Wiek et al., 2015, p. 246).[214]

Much like Wiek et al. (2011; 2015), the Swiss national competence center for ESD (éducation21, 2016) developed a framework that is far more condensed than the *Gestaltungskompetenz* model. Basing their work on existing competency approaches such as *Gestaltungskompetenz* (de Haan & Harenberg, 1999; de Haan, 2010; Wiek et al., 2011: 2015), éducation21 developed a framework of 10 straightforward competency domains. These are: 1 "Knowledge"; 2. "Systems"; 3. "Anticipation"; 4. "Creative Thinking"; 5. "Perspectives"; 6. "Cooperation"; 7. "Participation"; 8. "Responsibility"; 9. "Values"; and 10. "Action" (éducation21, 2016, p. 3f). There are, of course, myriad definitions and understandings of ESD competencies, complete with numerous long lists of sub-competencies. For the sake of brevity, many of these have been omitted.

"Cross-cutting key competencies" for the SDGs

Like both the theoretical section on knowledge elements (5.1) and the display of the data (4.6), this section also makes extensive use of the two aforementioned publications by UNESCO ('Education for Sustainable Development Goals", 2017a) and by OECD ("The OECD PISA global competence framework", 2018).

[214] According to Wiek et al. (2015), the six key competencies are: 1. "Systems thinking competence"; 2. "Futures thinking or anticipatory competence"; 3. "Values thinking or normative competence"; 4. "Strategic thinking or action-oriented competence", 5. "Collaboration or interpersonal competence"; 6. "Integrated problem-solving competence" (Wiek et al., 2015, pp. 243).

The UNESCO authors define key competencies[215] as being "transversal, multifunctional and context-independent" (UNESCO, 2017a, p. 10, emphasis by the author) and they argue that these key competencies are not intended to "replace specific competencies necessary for successful action in certain situations and contexts" (ibid.). Consequently, the authors build upon earlier sets of competencies from the DeSeCo line as suggested above, including the approaches of de Haan & Harenberg (1999), Wiek et al. (2011; 2015) and Rieckmann (2012) and define eight 'cross-cutting key competencies'. They are:

- "*Systems thinking competency*: the abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.
- *Anticipatory competency*: the abilities to understand and evaluate multiple futures – possible, probable and desirable; to create one's own visions for the future; to apply the precautionary principle; to assess the consequences of actions; and to deal with risks and changes.
- *Normative competency*: the abilities to understand and reflect on the norms and values that underlie one's actions and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.
- *Strategic competency*: the abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield.
- *Collaboration competency*: the abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.
- *Critical thinking competency*: the ability to question norms, practices and opinions; to reflect on […] one's [own] values, perceptions and actions; and to take a position in the sustainability discourse.
- *Self-awareness competency*: the ability to reflect on one's own role in the local community and (global) society; to continually evaluate and further motivate one's actions and to deal with one's feelings and desires.
- *Integrated problem-solving competency*: the overarching ability to apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that

[215] Key competencies "represent cross-cutting competencies that are necessary for all learners of all ages worldwide (developed at different age-appropriate levels). Key competencies can be understood as transversal, multifunctional and context-independent. They do not replace specific competencies necessary for successful action in certain situations and contexts, but they encompass these and are more broadly focused" (UNESCO 2017a, p. 10, building on conceptions of Rychen, 2003; Weinert 2001).

promote sustainable development, integrating the abovementioned competen[cies]" (UNESCO 2017a, p. 10).

The ESD community has put much effort into trying to outline the central challenges of learning in the context of sustainability in a precise, yet manageable list of potential overarching 'key competencies' (e.g. Wiek et al., 2011; éducation21, 2016; UNESCO, 2017a). The UNESCO list provided above has been selected because it is representative of many of the competency models in ESD although it is more condensed and concise than some of its earlier forerunners.

OECD global competence framework

Section 5.1 has only briefly introduced the OECD's "*OECD PISA global competence framework"* - which was part of the PISA 2018 testing - with regards to knowledge elements. In this section, more details will be given to the core of the framework, its competency conception. The framework is designed for formal education, especially schools, and it builds on two disciplines, ESD and its neighboring discipline Global Citizenship Education (GCE)[216]. Global competence is described as a "multidimensional capacity" and is defined as follows:

> *"Global competence is the capacity to examine local, global and intercultural issues, to understand and appreciate the perspectives and world views of others, to engage in open, appropriate and effective interactions with people from different cultures, and to act for collective well-being and sustainable development."*
> *(OECD, 2018, p. 7)*

[216] "Global Citizenship Education (GCE) is a framing paradigm which encapsulates how education can develop the knowledge, skills, values and attitudes learners need for securing a world, which is more just, peaceful, tolerant, inclusive, secure and sustainable" (UNESCO 2014b, p. 9).

Fig. 14: Global competence framework (Figure from OECD, 2018, p. 11, licensed under creative commons): global competence consists of four dimensions (inner circle) and four building blocks (outer circle).

The authors argue that 'global competence' is a 'singular' competency because its four dimensions, visible in the inner circle in Fig. 14, are "strongly interdependent and overlapping" (OECD, 2018, p. 8). As the above model indicates, the 'global competence' framework breaks with the usual structure of competency models in ESD, which often rely on listing different competencies. This framework, by contrast, suggests a circular model between the four competency dimensions and the so-called "building blocks", which have a complex relationship with each other. As was briefly suggested in section 3.2.1, and can be seen in the outer circle in Fig. 14, the OECD (2018) considers 'knowledge', 'skills', 'attitudes' and 'values' to be the building blocks in which competency development can take place (OECD, 2018, p. 12).

The OECD has been extremely influential in the competency debate in ESD and related disciplines – with the OECD DeSeCo project as suggested above. The current framework of OECD global competence is, compared to the usual lists in ESD, innovative in its structuring of the interdependence of its components. Nevertheless, from a growth-critical perspective, the application of the concept in accord with PISA testing needs to be critically observed and assessed over the coming years. According to the authors, it is hoped the assessment of 'global competence' in the PISA testing will identify how school students are being prepared to live in multicultural societies, as well as establishing "what works in global education and to accelerate progress toward the UN's Sustainable Development Goals" (OECD & Asia Society, 2018, p. 17).

Like the issue of education's focus on competencies that was mentioned in the beginning of this section, one of the key goals of global competence – to "thrive in a changing labour market"[217] – must also be contested from a growth-critical perspective. The next years will provide answers to questions such as: Will the framework actually be applied in accord with the definition for "collective well-being and sustainable development" (ibid., p. 7)? Or will it become just another educational tool to fulfill the desires of the "changing labour market"[218]?

Critical ESD: Sustainability competence, "sustain'abilities'" and political competence

While the UNESCO and OECD publications are clearly official positions, the following contributions were developed by authors in the critical ESD community. As was mentioned in section 3.2, the critical ESD community argues that some of the more political perspectives of ESD, such as 'sustainability citizenship', should be emphasized and that such perspectives could make ESD more socially critical. It is in this context that Wals created his model of sustainability competence and related "sustain'abilities'" (Wals, 2015, see also Wals & Lenglet, 2016; Wals, 2017).

Unlike many others, Wals does not draw on the OECD DeSeCo tradition, but instead relies on the UNESCO 'Delors Report'. Chaired by Jacques Delors, the report "Learning: The Treasure Within" (UNESCO 1996) has been influential for the international understanding of learning. The commission identified *four constitutive pillars of learning* (UNESCO, 1996, pp. 20): "Learning to know", "learning to do", "learning to be" and "learning to live together" (UNESCO, 1996, pp. 20; see also UNESCO, 2015, p. 39).

Basing his own work on these constitutive pillars of learning, Wals (2015) argues that 'sustainability competence'[219] should not be "an analytical term that cuts up human behavior into smaller pieces that can somehow be measured or captured in a rubric" (Wals, 2015, p. 11). Instead, as part of an integrative perspective on teaching, learning and capacity-building (Wals, 2017, p. 20), Wals sees sustainability competence as

> *"a relational, contextual and emergent property. As such[,] sustainability competence refers to a way of knowing, doing, being and transforming in action that leads to a temporary outcome that is considered the most sustainable given what we know, value and strive*

[217] http://www.oecd.org/pisa/pisa-2018-global-competence.htm, *Date of access: 31.05.2019*.

[218] ibid.

[219] In an earlier perspective Wals (2010) also suggested - based on work together with Cocoran - his holistic and integrative concept of sustainability competence by the ability of '*Gestaltswitching*' (Wals, 2010, p. 386; see also Wals & Corcocan, 2006, pp. 107). The term refers to the German word *Gestalt*, which can be translated as 'mind-set'. The 'switching' "refers to the ability to switch back and forth on a number of continua: spatial (local-regional-global), temporal (past-present-future), cultural, disciplinary, ethical, and so on" (Wals, 2012, p. 641) and occurs by "transformative disruptions" (irritation/crisis) (Wals, 2010, p. 385).

for at that moment in time while working on sustainability challenges in a concrete setting."
(Wals, 2015, p. 11)

Wals associates certain "sustain'abilities'" (Wals, 2015, p. 11) inspired by the four abovementioned pillars (UNESCO, 1996, pp. 20) with 'sustainability competence'. Tab. 10 below shows the four dimensions of sustainability competencies.

Tab. 10, taken from Wals: "Dimensions of sustainability competence and associated sustain'abilities'" (Wals, 2015, p. 11).

Sustainability competence	Examples of sustain'abilities'
Dynamics and content of sustainability	Sustainability literacy Systems thinking Adopting an integral view *Learning to know*
Critical dimension of sustainability	Questioning hegemony and routines Analysing normativity Disruptiveness, transgression *Learning to critique*
Change and innovation dimension	Leadership and entrepreneurship Unlocking creativity, utilizing diversity Appreciating chaos & complexity Adaptation, resilience Empowerment and collective change *Learning to make change*
Existential and normative dimension	Connecting with people, places and other species Passion, values and meaning-making Moral positioning, considering ethics, boundaries and limits *Learning to be, learning to care*

The dimensions and the related "sustain'abilities'" mirror the contemporary debates in the critical ESD community that were explored in sections 3.1 and 3.2. Like the 'global competence' framework (OECD, 2018), the structure of Wals' (2015) approach differs from that of many ESD scholars because he associates them with four spheres of learning.

Another, more general contribution from the critical community that also differs from the usual 'lists' of competency components is Sauvé's (2015) 'political competence'. Sauvé (2015) argues that including stronger political aspects and emphasizing the political dimension makes ESD more critical, enabling it to address not only socio-ecological realities, but also the underlying power structures that engender them (Sauvé, 2015, p. 105). Sauvé sees 'political competence' as being comprised of the following three elements:

"[K]nowledge concerning for example, socio-political structures and dynamics - those of proximity in the first place (laws and regulations, actors and power games, alternative political propositions, and so on); know-how, including skills for situational analysis,

argumentation, debate, the elaboration of strategies; and attitudes and values, focused on the consciousness of one's own power, on a sense of citizenship and willingness for personal and collective involvement" (ibid., p. 108).

Building on this, Sauvé conceptualizes what she calls a "know-how-to-act". This particular 'know-how' enables a process of collectively uncovering an individuals' own potential through active involvement in the political processes. It encourages a more systemic perspective by identifying its ultimate goal as addressing the power-relations underlying socio-ecological structures (Sauvé, 2015, p. 108).

6.2 Practical perspectives on competency components

As in the empirical section of the chapter on knowledge elements (5.2), the following section on practical perspectives on competency components presents the empirical results in a condensed manner. Also in this section, data examples ('anchoring quotes') will only be included that refer to central selected competency components. In most cases, footnotes refer to the underlying source of data. As in the previous chapter, the positions of both the experts and the case studies will be presented as unified.

Unlike the empirical results relating to knowledge elements, those relating to competency components are not organized according to a superordinate structure. Instead, the eight categories resulting from the analytic process are directly displayed.

Reflective and critical competency components[220]

In this category, the experts and case studies suggest competency components that are, for the most part, degrowth-specific. Other parts of the category refer to reflective and critical competency components on a broader, more general level.

For both research units, a central competency is the ability to reflect on how the values of economic growth are imprinted on one's own life.[221] In the case studies, especially in the theater workshop, the competencies of self-criticism and questioning society, oneself[222], and one's own mode of living emerged as crucial to almost all participants.[223] One of the interviewees went on to claim that reflecting on the impact of social acceleration on individual lives is a key competency in the context of degrowth.[224] Another case study highlights the importance of reflecting on the influence of ideology on the individual's own mind: "Is it something that I want or something society wants me to do?"[225].

The experts, however, focus on the importance of reflecting on one's own cultural background and the role of economic growth in shaping both culture and the social imaginary.[226] The experts also emphasize the capacity to examine the relationship between the individual and the societal levels[227] of the social imaginary.

[220] This category (i) contains of the following codes: E_i.1_Reflect historical and cultural background; E_i.2_Reflect growth paradigm and -values in one's own life; E_i.3_Political/structural-analytical thinking; CS_i.1_Question and critique society and one's own lifestyle; E_i.4_Systems thinking; E_i.5_Problem awareness; CS_i.2_Problem awareness; E_i.6_Perspective change and empathy; CS_i.3_Perspective change and empathy

[221] E_i.2: Experts_1: 35

[222] CS_i.1: Alexis_2: 39-41

[223] CS_i.1

[224] CS_i.1: Pip_2, 40

[225] CS_i.1: Addison_1: 78

[226] E_i.1: Experts_2: 98-99; E_i.1: Experts_1: 63-69

[227] E_i.2: Experts_1: 50-51

Also on the societal level, the experts suggest the importance of learners developing the capacity to think in terms of political categories:[228]

"The learners need the capacity to think in such categories like power and structures. This is something that many people do not have anymore. This enables to analyze a political economy."
(E_i.3: Experts_2: 78-81)

In more general terms, the experts and case studies consider reflective competencies and problem awareness[229] to be the starting point for the ability to recognize the problems and contradictions in one's own life and to initiate the required change[230] - such as changing one's own consumption habits and mode of living[231] as a result of the ability to critically reflect and question one's own basic assumptions[232].

Another competency component in that category that is more general and not only degrowth-specific is the capacity to think systemically with regards to interdependencies in (un-)sustainability[233]. Both the experts[234] and case studies[235] suggest that learners should also develop the ability to change their perspective on 'the question of growth' on the global level.

In sum, the key competency components for learners from the degrowth-informed educational practice in this category are as follows:

- The ability to question and criticize the impact of economic growth on one's personal life
- The ability to reflect on how economic growth shapes culture and the social imaginary
- The capacity to think politically
- The capacity to think systemically

Normative competency components[236]

This category includes normative aspects of competency components, values and beliefs for the learners. Experts and case studies highlight values of care and sustainability and respect for the ecological foundation and a connection to nature.

[229] E_i.3: Experts_2: 84
[230] E_i.5: Experts_1: 126; CS_i.2: Terry_2: 65
[231] E_i.2: Experts_2: 43
[232] CS_i.1: Vanja_1: 46
[233] CS_i.2: Alexis_2: 43
[234] E_i.4: Experts_1: 14
[235] E_i.6: Experts_1: 209
[236] CS_i.3: Tal_2: 74; CS_i.3: Chris_1: 42
[237] This category (ii) contains of the following codes: E_ii.1_Values of sustainability; CS_ii.1_Beliefs and values of care and sustainability; E_ii.2_Respect for ecological foundation; CS_ii.2_Post-alienation, re-connection to nature

One competency component in this category as suggested by the case studies is having a certain 'belief'.[237] Next to 'beliefs', the interviewees in the case studies frequently suggest that learners should develop values of care and sustainability.[238] Beliefs and values are emphasized because they are on the one hand considered components that lead to an active criticality (see previous section) and on the other hand enable resilience to the influence of the growth paradigm and the social imaginary. The case studies suggest that such normative abilities also strengthen emotional aspects:

> *"People that have such normative abilities do not only exist to contribute to this absolute economic system but instead they can experience nature, and they have the ability to actively create space for this."*
> *(CS_ii.1: Terry_1: 80)*

More detailed examples of such normative competency components by case studies and experts encompass the ability to make conscious ecological decisions[239] and overcoming alienation by a re-connection to nature[240].

Furthermore, the experts refer to how different normative frames and values are occupied in favor of growth. They suggest that the ability of framing 'positive symbols of limitation' - such as 'small is beautiful'[241] is a precondition for enabling change. By such 'positive symbols of limitation' they build on the assumption that mostly, limits are positively framed and limitations negatively[242], and that the negative connotation of limitations is a barrier to change, especially when it comes to individual patterns of consumption.

In sum, the key competency components for learners from the degrowth-informed educational practice in this category are as follows:

- Holding values of care
- Holding values of sustainability
- The ability to frame limitations positively

Psychological foundation[243]

This category relates to the psychological foundation and includes components such as motivation, openness to change, self-confidence, and the courage to experiment. Such components are closely related to competency components but they are not 'competencies' in the narrower sense. They were however

[237] CS_ii.1: Vanja_2: 60; CS_ii.1: Jordan_2: 105
[238] CS_ii.1
[239] E_ii.2: Experts_2: 103
[240] CS_ii.2: Neo_2: 64; CS_ii.2: Terry_2: 28
[241] E_ii.1: Experts_1: 190-191
[242] ibid.: 193
[243] This category (iii) contains of the following codes: CS_iii.1_Motivation and will to change system/social imaginary; CS_iii.2_Openness to change one's own habits; E_iii.1_Modesty to live sufficient lifestyles; E_iii.2_Overcome fear, have courage; CS_iii.3_Self-confidence, courage to leave comfort zone & experiment; CS_iii.4_Tolerance of failure and frustration, persist, patience; E_iii.3_Self-care, respect one's own passions, needs and limits; CS_iii.3_Self-care, respect one's own passion, needs and limits

often named in relation to competencies and skills, making the borders seem somewhat blurry here. The psychological foundation was not explicitly part of the data collection in either the interview guidelines or in the design of the focus groups in the expert workshop. However, aspects of the psychological foundation could clearly be reconstructed inductively without asking the participants and experts directly. In general, there was a far higher frequency of contributions from the case studies in this category than in those of the experts, and they often considered the psychological foundation in the context of their personal lives.

A central aspect in this category is motivation. The case studies suggest a strong interrelation between problem awareness and knowledge on certain issues (such as highlighted in the previous section and also in the chapter on knowledge elements) and the motivation to personally get involved.[244] The case studies suggest that somebody who wants to really engage in a change project and to transform something "should really get started with heart and soul"[245].

Aside from motivation, another psychological component that was suggested to be central for the learners is openness to change one's own habits:

> *"Learners need to be open to constantly question oneself and really be open for such a personal process. I find myself again and again turning everything upside down if I get new input."*
> *(CS_iii.2: Vanja_1: 96)*

The case studies, however, emphasize that abilities such as 'openness to change' are not easy to address, because learners might also face inner resistances "because it means to be ready to question the structure in their life that they grew up in"[246]. The experts also point out that a certain flexibility is needed to rethink one's own lifestyle and mode of living. They point out that a certain "modest approach and contentment"[247] is needed as a psychological foundation to develop the ability to live sufficient lifestyles (see following sections) but also the ability to enjoy them[248].

For both experts and case studies, such openness to considering lifestyle changes is connected to the component to have courage to overcome fears[249], which can occur when fundamentally questioning deep-seated aspects of the social imaginary, or when 'thinking out of the box' and encountering psychological barriers to change. Connected to this is the ability to tolerate failure and frustration[250] and to patiently persist in complicated situations, which was suggested by the case studies.[251] Consequently, another psychological component

[244] CS_iii.1: Noor_2: 32
[245] CS_iii.1: Riley_1: 52
[246] CS_iii.2: Alexis_1: 61
[247] E_iii.1: Experts_2: 213
[248] ibid.
[249] E_iii.2: Experts_2: 6
[250] CS_iii.4: Jordan_1: 84
[251] CS_iii.4: Celeste_2: 59; CS_iii.4: Celeste_1: 32; CS_iii.4: Tal_1: 16

suggested by the case studies refers to a healthy self-esteem[252], which is necessary 'to pull something through', to set one's own mind and to be able to deal with rejection.[253]

Another important component in this category as suggested by both case studies and experts is that learners should have the ability to respect one's own needs[254] - the biological and ideological[255] needs. The case studies emphasize this psychological components because according to them, this is something that is often ignored or underestimated by very active and engaged political milieus such as the degrowth movement in which people often cross their own psychological boundaries.[256] Consequently, self-care and self-respect are considered to be central abilities, because they can release a lot of energy that could be used for focusing on bigger, more political issues.[257] Such psychological components and abilities are considered to be important precondition for social and political transformation.

In sum, the key components for learners from the degrowth-informed educational practice in this category are as follows:

- Motivation to get involved
- Openness to change one's own habits
- Courage to overcome psychological barriers
- The ability to tolerate failure
- Self-confidence
- Self-care and respect for one's own needs

Competency components for unlearning and resistance[258]

In this category, the experts and the case studies suggest competency components for the learners that relate to the implementation of critical capacities (as suggested above) into one's own practical behavior. This category encompasses abilities such as unlearning and resisting the dominant culture and social imaginary, as well as the ability to resist alienation and dominant consumption patterns.

For unlearning and resistance, the case studies suggest the ability to distance oneself from societal expectations and demands, such as the postmodern work ethos[259]. They suggest that there are certain cultural practices that need to be resisted. Learners can resist such practices if they first of all develop the

[252] CS_iii.3: Pip_2: 44
[253] CS_iii.3: Tal_2: 74; CS_iii.3: Addison_1: 52
[254] CS_iii.5: Celeste_1: 55
[255] E_iii.3: Experts_1_Paper note
[256] E_iii.3: Experts_1: 189
[257] CS_iii.5: Chris_2: 76
[258] This category (iv) contains of the following codes: E_iv.1_Unlearn and resist dominant culture & social imaginary; CS_iv.1_Unlearn and resist dominant social imaginary; E_iv.2_Unlearn, overcome and resist alienation and capitalism; E_iv.3_Unlearn and resist dominant consumption patterns
[259] CS_iv.1: Pip_2: 44

ability to understand the mechanisms and compulsions behind such practices, as in the following examples:

> *"A woman gets phone calls from her boss in the evening at half past nine and such things... One needs to figure out what to do against those things and to see that it is ok not to answer the phone. It is about developing the ability to understand such compulsions and what to do about them."*
> *(CS_iv.1: Pip_2: 36)*

The experts suggest similar competency components for the learners such as the ability to liberate oneself from values, images, symbols and maybe even "familial and historical contexts"[260] that lead to the acceptance of growth compulsions. According to them, the step after this 'liberation' that the learners have to take is the ability to live and occupy new imaginaries and cultural practices in one's own life[261]. This is especially highlighted by the experts as an ability to unlearn and resist dominant behavior patterns of consumption.[262]

However, for the experts, this goes not only for the sphere of consumption but also for the ability of unlearning and resisting certain patterns that align with capitalism and that are connected to phenomena such as alienation:

> *"For overcoming capitalism, learners need to develop the ability of being resilient and to resist. Learners need the capacity of active unlearning, especially in the context of formal school education, when capitalism is unconsciously taught."*
> *(E_iv.2: Experts_2: 100)*

This quote suggests that 'resilience' and 'resistance' are central abilities in the context of overcoming capitalism. Another example that connects to these two components is the ability to set spaces of 'resonance'[263], a concept that has been referred to in detail in the theoretical chapter 2.

In sum, the key competency components for learners from the degrowth-informed educational practice in this category are as follows:

- The capacity to understand the mechanisms behind dominant cultural practices
- The ability to resist and unlearn cultural practices that relate to economic growth
- The ability to be resilient and to resist capitalism
- The ability to set spaces of 'resonance'

Competency components for authentic lifestyles[264]

[260] E_iv.1: Experts_2: 48
[261] E_iv.1: Experts_2: 51
[262] E_iv.3: Experts_1: 16
[263] E_iv.2: Experts_2: 166
[264] This category (v) contains of the following codes: E_v.1_Live a balanced good life; CS_v.1_Live holistic and authentic lifestyles; E_v.2_Enable sufficiency and subsistence in lifestyles

This category is distinct from the other categories of competency components, and is mentioned in the data only occasionally. The experts and case studies suggest competency components in relation to authenticity, balanced and holistic lifestyles and sufficiency.

The case studies suggest that learners need the ability to consider their own life in a holistic way[265], which often refers to not apply different standards of measurement to different spheres of life – but instead develop the capacity to be 'authentic':

> *"I think learners should develop the ability to be authentic with their lifestyles and thus convincing for other people."*
> *(CS_v.1: Gray_1: 62)*

Words such as 'authentic' or 'holistic' are used by the experts to describe the ability to live lifestyles beyond the inner contradictions of capitalism[266]. This connects to the ability to unlearn certain cultural practices in favor of economic growth that was discussed above.

According to the experts, a balanced good life also requires the ability to live in a more or less self-sufficient, less consumerist[267] way, which connects to the idea that "immaterial needs cannot be satisfied with material goods"[268] (see section 5.2) – a typical point of critique of modern consumption patterns.

In sum, the key competency components for learners from the degrowth-informed educational practice in this category are as follows:

- The ability to live balanced lifestyles
- The ability to live authentically in accordance with one's values
- The ability to live self-sufficiently

Manual and practical competency components[269]

In this category, both experts and case studies suggest competency components for the learners such as practical and manual skills, the use of tools, repairing, gardening and agriculture.

The experts suggest that learners should acquire practical abilities for subsistent lifestyles[270] while the case studies suggest that such abilities are a precondition for learners to be able to deal with a prospective or future society[271].

[265] CS_v.1: Addison_1: 60
[266] E_v.1: Experts_2: 23
[267] E_v.2: Experts_2: 254
[268] E_v.1: Experts_2: 130
[269] This category (vi) contains of the following codes: E_vi.1_Practical skills and abilities; CS_vi.1_Practical skills and abilities; E_vi.2_Manual skills, use tools, repair etc.; CS_vi.2_Manual skills, use tools, upcycling, repair etc.; E_vi.3_Gardening skills; CS_vi.3_Agriculture & gardening skills
[270] E_vi.1: Experts_2: 41
[271] CS_vi.1: Addison_2: 130

More specifically, the case studies suggest that manual skills, such as the ability to use tools and to repair things, play a crucial role in living sustainably.[272]

Both the case study participants[273] and the experts[274] made comments about gardening or agricultural skills for learners being necessary for building a degrowth society. An explanation for this is that the sector of food production is strongly connected to manual skills. Such skills in the context of sufficient and subsistent lifestyles could contribute to independence from industrial food production:

> *"Working on the farm, I realized that I had become much more independent. I could live much more naturally and didn't rely on societal structures. Therefore, learners should develop the ability to produce food by themselves."*
> *(CS_vi.3: Blair_1: 66)*

Thus, agricultural skills and abilities are seen as contributing to a 'good' life although, the case studies argue, the details of such specific (manual) skills are always project-related and can vary depending on the context.[275]

In sum, the key competency components for learners from the degrowth-informed educational practice in this category are as follows:

- Practical and manual abilities for subsistent lifestyles
- Agricultural and gardening skills for subsistent lifestyles

Collective and social competency components[276]

In this category, which was discussed frequently, the case studies but also the experts suggest collective and social competency components in a very differentiated way. The category includes general aspects of social skills and negotiation and of collective self-organization such as project management and organization. More specifically, they name abilities such as actively creating space for collective experiments and managing commons collectively.

In general terms, the case studies suggest that social skills[277] are important for the learners. The participants in the case studies consider the abilities to inspire other people[278] for change projects[279], to be convincing[280] and the ability to communicate and to present in front of an audience[281] to be especially useful.

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[272] CS_vi.2: Terry_2, 26
[273] CS_vi.3: Blair_1: 66
[274] E_vi.3: Experts_2: 144
[275] CS_vi.3: Addison_1: 82)
[276] This category (vii) contains of the following codes: CS_vii.1_Communicate, inspire and motivate others; E_vii.1_Social negotiation and social competence; CS_vii.2_Social negotiation and social competence; E_vii.2_Create space for collective experiments; CS_vii.3_Empower others with getting started and experimenting; E_vii.3_Collective self-organization; CS_vii.4_Project management and organizational skills; CS_vii.5_Organize network/team, basic conditions in the coand funding; CS_vii.6_Utilize social diversity in skills and know-how; E_vii.4_Manage commons collectively
[277] CS_vii.1: Addison_1: 60
[278] CS_vii.1: Terry_1, 80; CS_vii.1: Lee_2, 28
[279] CS_vii.3: Riley_2: 30; CS_vii.3: Neo_2: 66
[280] CS_vii.1: Gray_1, 60
[281] CS_vii.1: Zan_2, 64

The case studies suggest that the ability to inspire and motivate others to participate in making change connects to being passionate about a project (as suggested in the section on the psychological fundament).

Furthermore, both the experts and case studies suggest that the fundamental ability to negotiate in social contexts[282] and the ability of "organizing processes collectively"[283] is important to the category of collective and social competency components. The case studies consider that on the interpersonal level, certain skills of 'tactfulness' are important for negotiations[284]. They also point out that social negotiation sometimes requires the ability to leave one's own comfort zone[285]. Thus, also the ability to tolerate conflicts[286] is highlighted as being crucial to initiate change. Furthermore, an 'inner flexibility' is acknowledged as being a valuable social ability for the learners[287].

Another competency component for the learners is the ability to utilize social diversity in skills and know-how[288] for enabling collectivity and collective organization.

> *"We all have the ability to make change differently. Degrowth is such a broad topic that reaches out to all spheres of life and has various possibilities to get involved. Therefore, the central ability is to make use of such diversity."*
> *(CS_vii.6: Alexis_1: 59)*

As detailed abilities for collective organization, the experts name actively creating, occupying and shaping spaces as well as trying out and experimenting with economic alternatives[289]. The experts suggest that learners should develop the ability to deal with the commons because negotiating about the commons on a small scale such as in the gardening project is precondition for upscaling such abilities towards becoming political abilities.[290]

Other suggestions made by the case studies relate more to practical preconditions than to competencies in the narrower sense. They highlight that for individual and collective organization, learners need to have access to practical 'resources', such as a team that joins in[291], time, networks[292] and potential funding[293]. They argue that they would also need related abilities for project planning and management[294], for steering group-processes[295] and writing project-

[282] E_vii.1: Experts_2: 132
[283] E_vii.3: Experts_2: 85-86; E_ii3.2: Experts_1: 61
[284] CS_vii.2: Blair_1: 64
[285] CS_vii.2: Celeste_1: 32
[286] E_vii.1: Experts_2: 6
[287] CS_vii.2: Tal_2: 50
[288] CS_vii.6: Zan_2: 64
[289] E_vii.2: Experts_2: 66
[290] E_vii.4: Experts_2: 210
[291] CS_iii1.2: Celeste_1, 55
[292] CS_iii1.2: Pip_2, 36
[293] CS_vii.5: Celeste_1: 55
[294] CS_vii.4: Riley_1, 56; CS_vii.4: Lee_2: 48
[295] CS_vii.4: Jody_1, 54

proposals[296] because they are useful for making change and initiating processes and projects.[297].

In sum, the key components for learners from the degrowth-informed educational practice in this category are as follows:

- Social skills
- Communicative and presentation skills
- The ability to organize collective processes
- The ability to manage commons
- The ability to negotiate and tolerate conflicts
- The ability to plan and manage projects

Political and systemic competency components[298]

This category of political and systemic competency components builds only on suggestions by the experts – triangulation was not possible. The suggestions include political empowerment and competency components for political action as well as for changing political structures, for accepting political responsibility and for re-organizing labor beyond commodification.

The experts argue that collective organization as suggested in the previous sections is not enough and that for real systemic change, learners need the political ability to change structures and institutions.[299] For them, such abilities are connected to political empowerment, in addition to psychological empowerment and collective organizational skills.

Another component that was highlighted here is that learners should have the ability and the will to accept responsibility for political processes.[300] The following quote indicates that for the experts, the political and systemic level includes the ability to raise questions of how to deal with power:

> *"Degrowth is still a niche project. If degrowth wants to enter structures and institutions, then it needs to step out of the niche and tackle these central questions how to enable learners for the ability to accept responsibility and how to deal with power."*
> *(E_viii.2: Experts_3: 9)*

Another component in this political and systemic category of competency components is that learners should develop abilities that enable them to contribute to a decommodified organization of labor and a reappropriation of economics by democratic and collective action.[301] This includes also creating another idea

[296] CS_vii.5: Gray_2: 70
[297] CS_iii1.1: Vanja_2: 60
[298] This category (viii) contains of the following codes: E_viii.1_Political empowerment and political action; E_viii.2_Change political structures, accept political responsibility; E_viii.3_Decommodified re-organization of labor
[299] E_viii.2: Experts_2: 43; E_viii.1: Experts_2: 16
[300] E _viii.1: Experts_2: 183-185
[301] E_viii.3: Experts_2: 72

of labor: "Commodification understands labor as a commodity while decommodification understands labor as an activity."[302]

In sum, the key competency components for learners from the degrowth-informed educational practice in this category are as follows:

- The ability to initiate political and systemic change
- The ability to accept responsibility in political processes
- The ability to organize labor in a de-commodified way

[302] E_viii.3: Experts_2: 119

6.3 Discussion of competency components

The first section of this chapter (6.1) introduced theoretical perspectives on competency components from the ESD community. The second section (6.2) introduced competency components from the practical perspectives of the degrowth-informed educational practice. Building on these two sections, this third section will discuss and draw conclusions to the fourth research question: 'Which competency components from the degrowth-informed educational practice should be integrated into ESD?'

In the empirical-analytical process, competency components from the degrowth-informed educational practice were classified into eight categories. They are: *reflective and critical competency components*, *normative competency components, psychological foundation, competency components for unlearning and resistance*, *competency components for authentic lifestyles, manual and practical competency components, collective and social competency components and political and systemic competency components*. In the next paragraphs, each category will be discussed with reference to ESD competency models (section 6.1) and the degrowth debate (chapter 2).

The category *reflective and critical competency components* includes components that are degrowth-specific, such as the 'ability to question and criticize the impact of economic growth on one's personal life' and 'on how economic growth shapes culture and the social imaginary'. These components include a grade of specification to economic growth that is not apparent in most of the ESD competencies. Not even the growth-critical examples of competency models in ESD relate explicitly to economic growth. Wals' conception of sustainability competence, for instance, identifies the need for "learning to critique" (Wals, 2015, p. 11) – as well as the development of "sustain'abilities'" such as "questioning hegemony and routines" (ibid.). These only indirectly address growth-criticism. However, the empirical category *reflective and critical competency components* also includes more general components, such as the 'capacity to think politically' and 'the capacity to think systemically', which feature extensively in other ESD conceptions (e.g. Rieckmann 2012, p. 134; éducation21, 2016, pp. 3; UNESCO 2017a, p. 10). In sum, ESD already includes many of the reflective and critical abilities also promoted by degrowth – save those that are explicitly growth-critical.

The category *normative competency components* includes components that are not necessarily competencies in the narrower sense. Some of these are typical of ESD, such as 'holding values of sustainability' (see Wiek et al., 2015, p. 246; éducation21, 2016, pp. 3; UNESCO 2017a, p. 10). The category also includes some components not typically found in ESD, such as possessing 'values of care' and the 'ability to frame limitations positively'. However, such aspects relate to some of critical ESD author Wals' "sustain'abilities'", including "moral positioning, considering ethics, boundaries and limits" and to his

"learning dimension" of "learning to be [;] learning to care" (Wals, 2015, p. 11). In degrowth, by contrast, such aspects are not peripheral. Rather, as was pointed out in chapter 2 of this thesis, principles such as care are central categories in degrowth reasoning (e.g. Biesecker & Hofmeister, 2010).

In the category *psychological foundation,* the empirical components are not explicitly part of ESD competency models, which is no surprise because they are not 'competencies' in the narrower sense. The components here, such as learners' 'openness to change their own habits', individuals' possession of the 'courage to overcome psychological barriers', as well as 'self-care and respect for one's own needs', relate more to psychological preconditions. However, some similarities to ESD competency models exist. Parallels are obvious, for instance, in one of the sub-competencies of *Gestaltungskompetenz*, the ability to "cope with individual dilemmatic situation[s] of decision-making" (de Haan, 2010, p. 320) or with the "self-awareness competency" given in UNESCO's "cross-cutting key competencies" (UNESCO 2017a, p. 10).

Competency components for unlearning and resistance is a category in which the components are quite different from ESD competency models (see section 6.1). The category relates much more to the degrowth debate, as the different competency components connect directly or indirectly to the social imaginary. Degrowth-specific competency components in this category are, for instance, the 'ability to resist and unlearn cultural practices that relate to economic growth' and the 'ability to be resilient and to resist capitalism'. As was explained in detail in chapter 2, the notion of decolonizing the social imaginary (Latouche, 2015) is central to degrowth.

Another competency prevalent in the degrowth debate that relates to both the *psychological foundation* and *competency components for unlearning and resistance,* is the 'ability to set spaces for 'resonance''. In the context of degrowth, Rosa (2016) described "resonance" (ibid.) as the connection to the world that informs a '(good) life'. Moreover, he identified resonance as one capacity that directly relates to both normativity and to overcoming alienation. According to Rosa, education should focus on fostering and supporting 'resonance capacity' (Rosa, 2016, p. 418, see section 2.3.1), as in the data, because it offers a potential remedy for (the symptoms of) social acceleration.

Competency components for authentic lifestyles is a category that is useful for ESD to only a limited extent. The components found in the data, such as the ability 'to live balanced lifestyles', or 'to live self-sufficiently', could be relevant to ESD. They are not alien to the ESD discourse, but nevertheless they are not included in the majority of competency models in ESD (see section 6.1). However, they do relate to the degrowth debate in the sense that, for degrowth, fundamental changes in lifestyles (e.g. Paech, 2017) and/or 'mode[s] of living' are considered necessary (Brand & Wissen, 2017a). The degrowth conception of the "imperial mode of living" (ibid.) also relates to components that were suggested in the previous sections - such as the 'ability to question and criticize

the impact of economic growth on one's personal life' and the 'ability to resist and unlearn cultural practices that relate to economic growth' and capitalism. This is because the imperial mode of living is linked to the ideological domination of people by economic growth and thus connects to its hegemony.

The category *manual and practical competency components* includes components that are very specific to skills needed for the implementation of subsistence lifestyles, such as 'practical and manual abilities for subsistent lifestyles', as well as 'agricultural and gardening skills for subsistent lifestyles'. Components of this kind are usually not suggested in the ESD competency models (see section 6.1), perhaps due to the abstract manner in which ESD competencies are often formulated. However, they could be relevant for degrowth-informed ESD because they provide links for the learners to competency components in the other categories, such as *competency components for authentic lifestyles*.

The category *collective and social competency components* encompasses many competency components also typical in ESD, such as 'social skills', 'communicative and presentation skills', 'the ability to negotiate and tolerate conflicts' and 'the ability to organize collective processes' (e.g. de Haan, 2010, p. 320; éducation21, 2016, pp. 3; Wiek et al., 2015, pp. 243). These components are mirrored in ESD in, for instance, "strategic competency" and "collaboration competency", which are taken from the "cross-cutting key competencies" authored by UNESCO (2017a, p. 10). From the critical ESD community, Wals lists "sustain'abilities'" such as "unlocking creativity, utilizing diversity" and "empowerment and collective change" (Wals, 2015, p. 11). By contrast, the ability to manage commons is rather degrowth-specific and not included in the ESD competency models (see section 6.1). Although *collective and social competency components* relate to ESD competency models, they also overlap with the degrowth debate, in particular with regard to the building of local alternatives. Section 2.4 explored how local alternatives, such as commons; alternative economies, such as sharing economies; and transition projects are seen in their political potential to contribute to overarching systemic change. Therefore, learners' acquisition of such competencies may lead to improving their individual and collective organization, which in turn may lead to a more collectivized perspective on a broader level, which is necessary for system change.

Political and systemic competency components, are not new to ESD competency models either (e.g. de Haan, 2010, p. 320; éducation21, 2016, pp. 3). One example from critical ESD is Sauvé's "political competence". She suggests that competency components should be more political and address both the systemic aspects underlying power relations and "a sense of citizenship and willingness for personal and collective involvement" in political processes (Sauvé, 2015, pp. 105). However, the competency components identified in the results of this thesis, such as the 'ability to initiate political and systemic

change', the 'ability to accept responsibility in political processes' and the 'ability to organize labor in a de-commodified way', go beyond the components found in the majority of ESD competency models. Degrowth-informed ESD should focus on learners' acquisition of such political and systemic abilities because they may then be able to enter and meaningfully influence the spheres of practical politics.

In sum, many of the components that arose in the empirical part of this study are already included to some extent in many ESD competency models. However, the results suggest a much larger overlap between degrowth and *critical* approaches such as the competency model of Wals (2015, p. 11), than, for instance, the lists of competencies in the DeSeCo tradition (e.g. de Haan, 2010; Rieckmann 2012; UNESCO, 2017a) or the recent OECD contribution to global competence (OECD, 2018). Global competence however, bears a promising and innovative structure for connecting its different competency components in the "building blocks" of "knowledge", "skills", "attitudes" and "values" (OECD, 2018, p. 12): The empirical results indicate that the borders between these "building blocks" (ibid.) are blurry from the perspective of the degrowth-informed educational practice and that many overlaps between them exist.

However, three entire categories – *competency components for unlearning and resistance, competency components for authentic lifestyles* and *manual and practical competency components* – do not have an equivalent in the ESD competency models as suggested in the theoretical section 6.1. Alongside these abovementioned empirical categories, there are also detailed competency components within other ESD-related categories that are quite specific to degrowth. The following (non-exhaustive) examples are degrowth-specific and have not yet been incorporated into the presented ESD competency models[303]:

- The ability to question and criticize the impact of economic growth on one's personal life
- The ability to reflect on how economic growth shapes culture and the social imaginary
- The ability to resist and unlearn cultural practices that relate to economic growth
- The ability to be resilient and to resist capitalism
- The ability to live authentically in accordance with one's values
- The ability to live self-sufficiently
- Practical and manual abilities for subsistent lifestyles
- The ability to manage commons
- The ability to initiate political and systemic change
- The ability to organize labor in a de-commodified way

[303] Since the theoretical overview is by no means exhaustive, there could potentially be more and other ESD competency models that also address these categories.

The educational practice can make use of, at least to some extent, all of the competency components that are listed above. In particular, the abilities 'to reflect on how economic growth shapes culture and the social imaginary', 'to question and criticize the impact of economic growth on one's personal life', 'to resist and unlearn the cultural practices that relate to economic growth' and 'to be resilient and to resist capitalism' should be addressed by educators in the practice of ESD.

As section 2.3 illustrates, the critique of capitalism is a central part of the degrowth debate in the narrower sense. Degrowth's capitalist critique builds on Critical Theory, which considers ideological and cultural forces as well as their manifestations to be a barrier to emancipation (Horkheimer 1982, p. 161). Thus, competencies that are not only critical but eventually lead to the 'decolonization' of the social imaginary (Castoriadis, 1987, Latouche, 2015) from both the growth paradigm and capitalism can be considered to be crucial for enabling learners to actively participate in building a more sustainable society. Only if learners develop abilities that disable the reproduction of growth in a paradigmatic, hegemonic and ideological sense, can learners contribute meaningfully to sustainability. The competency components from the degrowth-informed educational practice could, if properly utilized, potentially subvert the domination of the social imaginary that accompanies ideological power.

7 Pedagogical approaches

This chapter, which focuses on pedagogical approaches, follows the same structure as the previous two chapters on knowledge elements (5) and competency components (6). The first section will introduce some of the key theoretical perspectives on pedagogical approaches (7.1). This will be followed by a brief overview of the practical perspectives on pedagogical approaches generated in the empirical results of this study (7.2), as well as a discussion of these two sections (7.3) in relation to research question 5: Which pedagogical approaches from the degrowth-informed educational practice should be integrated in ESD?

7.1 Theoretical perspectives on pedagogical approaches

In the UNESCO 'roadmap' for the GAP, the function of "pedagogy and learning environments" (UNESCO, 2014c, p. 12) is conceptualized as "[d]esigning teaching and learning in an interactive, learner-centered way that enables exploratory, action oriented and transformative learning [and] [r]ethinking learning environments […] to inspire learners to act for sustainability" (ibid.). In the ESD community, there seems to be a near consensus that the pedagogical aim of ESD is to motivate learners to actively participate in socio-ecological transformations (see UNESCO, 2017a, p. 54). For critical ESD scholars, this kind of learning should enable non-conformism, participation, transformation and socio-constructivism (Jickling & Wals, 2008). One of the key challenges for ESD, however, is that most kinds of learning can be *facilitated* or *fostered* rather than *taught* directly:

> *"Sustainability, in a sense, cannot be taught. At best, teachers can create environments that are conducive to the exploration of sustainability issues around climate change, poverty, food security, biodiversity, and so on. As such, teaching sustainability becomes an educational design challenge."*
> *(Wals, 2015, p. 17)*

For ESD, Wals claims, the challenge is to design learning environments that are experiential and focus on self-organization, reflection and "an atmosphere of cooperation and confidence" (Barth et al., 2007, p. 421). Therefore, most approaches and methods for creating such critical-emancipatory spaces (see Vare & Scott, 2007) focus on involving learners in practical and situated educational opportunities.

The most relevant pedagogical approaches to this thesis, such as transformative learning, have already been introduced in detail in chapter 3. In that which follows, a selection of eight pedagogical approaches that aim to create such critical-emancipatory educational environments will be introduced. The structure of these eight pedagogical approaches' presentation is necessarily

unorthodox, because the various differing approaches do not necessarily function on the same level or scale, and are thus not directly comparable. They range from principles, pedagogies, instructional approaches, methodologies, methods, and characteristics to teaching strategies of the learning process. These pedagogical approaches display many similarities in terms of content, although in many cases the terminology varies considerably. For the sake of clarity and readability, this study limits itself to using the term 'pedagogical approaches'. Due to the difficulties inherent in the presentation and comparison of these pedagogical approaches, they will each be briefly introduced in relatively general terms, and then compared and contrasted with each other.

'Education for SDGs' and 'Global Competence'

The UNESCO publication on education for SDGs suggests an "action-oriented transformative pedagogy" (UNESCO 2017a, pp. 54). The authors' pedagogical conception relates to three "key pedagogical approaches" (ibid., p. 55) in ESD: "[a] learner-centered approach"[304]; "[a]ction-oriented learning"; and "[t]ransformative learning"[305] (ibid.). Furthermore, they suggest "key methods" (ibid.) for learning for the SDGs, they include:

> *"Collaborative real-world projects, such as service-learning projects and campaigns for different SDGs;*
> *Vision-building exercises such as future workshops, scenario analyses, utopian/dystopian story-telling, science fiction thinking, and forecasting and backcasting;*
> *Analyses of complex systems through community-based research projects, case studies, stakeholder analysis, actors' analysis, modeling, systems games, etc.;*
> *Critical and reflective thinking through fish-bowl discussions, reflective journals, etc." (ibid.)*

The focus of 'global competence' is on the competency model (OECD, 2018). However, in the contemporary teachers' resource of the 'global competence' framework (OECD & Asia Society, 2018), the authors suggest a certain set of what they call '*instructional approaches'* to promoting student engagement and interaction. They are: "[s]tructured debates"; "organized discussions"; "current events" "discussions"; "playing games"; "project-based learning"; "service learning" (ibid., p. 6).

However, because neither the UNESCO publication on education for SDGs (2017a) nor the "OECD Global Competence framework" (OECD, 2018) places much emphasis on pedagogical approaches, the value of their commentary on the subject is limited.

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[304] "Learner-centred pedagogy sees students as autonomous learners and emphasizes the active development of knowledge rather than its mere transfer and/or passive learning experiences. The learners' prior knowledge as well as their experiences in the social context are the starting points for stimulating learning processes in which the learners construct their own knowledge base" (Barth, 2015, cited in UNESCO, 2017a, p. 55).

[305] see section 3.2.

ESD research community

The Swiss educational agency *éducation21* (no date) has suggested *pedagogical principles* of ESD based on a review of previous pedagogical models. In their conclusion, they suggest a readily applicable and compact number of principles. These are: focusing on vision; participation and empowerment; long-term thinking; discovery (explorative) learning; network thinking; equal opportunities; reflection of values; and a focus on activity (éducation21, no date, my translation).

While *éducation21's* suggestions are obviously taken from an official agency, the following contributions are from individual authors in the ESD research community. One earlier contribution comes from critical ESD scholar Stephen Sterling, who argues that the primary pedagogical aim of 'strong' ESD should be to "link systemic and critical thinking and environmental and social action, or in other words, develop ecoliteracy and political literacy for full and active citizenship" (Sterling, 1996, p. 35). According to Sterling, in order to fulfill these aims, education needs to be: "[c]ontextual, innovative and constructive"; "holistic and human in scale"; "integrative"; "process oriented and empowering rather than product oriented"; "critical"; "balancing"; "systemic and connective"; "ethical"; "purposive"; and "inclusive and lifelong" (ibid., pp. 22).

In the same publication, Sterling suggests that certain *methodologies* align with these qualities. These are:

> *"experiential and cooperative learning; systemic thinking, patterns, soft boundaries and 'fuzzy logic'; the clarification and judgment of values; ideology critique; critical refection and creative thinking; the envisaging of sustainable futures; sensory and empathetic exercises; communication skills; learning as a continuous process for all; and work outdoors and in the community."*
> *(ibid., pp. 35)*

Another, more recent approach comes from Künzli David and Bertschy, who define a number of *'didactical' principles* relevant to ESD which are partly "general didactical principles" and partly "specific didactical principles" for ESD (Künzli David & Bertschy, 2012, p. 42). According to them, general didactical principles encompass "[a]ction and reflection orientation; exploratory learning; accessibility; [and] combining formal and material learning" (ibid.). Specific didactical principles for ESD include "[v]ision orientation; connected learning; [and] participation orientation" (ibid.)

In the context of 'Higher Education for Sustainable Development' (HESD), Barth (2015; 2016) identified "learning by doing" and "learning by reflecting" as core "learning and teaching approaches" (Barth, 2015, pp. 94). Furthermore, he suggests three "key principles" (ibid.) for fostering the development of competencies. They are; "[s]elf-directed learning", in which learning is only connected to teaching to a limited extent, and an active, self-organized

process can therefore stimulate learning (ibid., pp. 329); "[c]ollaborative learning", where, in the process of social collaboration, not only cognitive, but also emotional and affective competencies can be developed (ibid., p. 330); and "[p]roblem-oriented learning" which is an applied process where learners develop innovative solutions for complex problems, and particularly "action-relevant, procedural knowledge and skills" (ibid., p. 330) can be acquired.

Building on the distinction of instrumental and emancipatory ESD approaches introduced in section 3.1, Wals suggests that learning in "post-normal times" (Wals, 2012, p. 636) is closely connected to the principles of transformative learning. He argues that there are seven non-conventional forms of learning for ESD, which are: "[d]iscovery learning"; "[p]articipatory/collaborative learning"; "[p]roblem-based learning"; "[i]nterdisciplinary learning"; "[c]ritical-thinking-based learning"; "[s]ystems-thinking-based learning"; and "[s]ocial learning (multi-stakeholder)" (Wals, 2017, p. 21).

Review of pedagogical approaches

Based on a review of different 'sustainability pedagogies', Cotton and Winter identify a number of general and recurring principles and teaching strategies for sustainability in higher education. They conclude that sustainability pedagogies encompass "participatory and inclusive education processes, transdisciplinary cooperation, experiential learning and the use of environment and community as learning resources, all of which involve student-centred and interactive enquiry-bases approaches to teaching and learning" (Cotton & Winter, 2010, pp. 41).

In terms of teaching strategies, Cotton and Winter suggest that most approaches make use of "active experiential learning, interdisciplinarity and […]local (and regional) environment[s] for educational purposes" (ibid., pp. 45). They summarize the following pedagogical strategies for ESD: "[r]ole-plays and simulations"; "[g]roup discussions"; "[s]timulus activities"; "[d]ebates"; "[c]ritical incidents"; "[c]ase studies"; "[r]eflexive accounts"; [p]ersonal development planning (PDP)"; "[c]ritical reading and writing"; "[p]roblem-based learning"; "[f]ieldwork"; and "[m]odeling good practice" (ibid., pp. 46).

Summary: Pedagogical approaches between reflection, action, autonomy and collaboration

The last section introduced eight pedagogical contributions to ESD, including the two documents used for comparison in chapters 5-7 (UNESCO, 2017a; OECD 2018; OECD & AsiaSociety, 2018), five selected contributions from the 'official' (education 21, no date) and critical ESD communities (Sterling, 1996; Künzli David & Bertschy, 2012; Barth, 2016; Wals, 2017) and a systematic

review of pedagogical approaches in ESD (Cotton & Winter, 2010). Many of these approaches have a strong focus on student-centered pedagogies, with experiential, situated and problem-based approaches on the one hand, and transformative learning theories on the other.

Despite the differing terminology and scale of the collections or sets, there are perhaps four general pedagogical tendencies that can be identified as common threads linking the different publications. It should be noted that these pedagogical tendencies emerged through general observation rather than systematic analysis. They are:

1. *Action*[306], including exploration and experience[307] and problem-orientation[308]
2. *Reflection*[309], including values clarification[310], visioning[311] and critique[312]
3. *Autonomy, empowerment and individuality*[313]
4. *Collaboration, networking and interaction*[314], including participation[315] and local application[316]

These four pedagogical tendencies appear also in other, more general theoretical contributions. Autonomy and collaboration, for instance, can be seen in Barth's notion of the interrelation of 'self-directed learning' and 'collaboration' as a foundation for 'problem-based learning' (Barth, 2015, p. 94*)*. Action and reflection, too, are particularly prevalent in the general ESD discourse. In the éducation21 model, for instance, the two sides of action and reflection are considered "complementary and interdependent" (éducation21, 2016, p. 3) in the learning process. Barth also distinguishes between "learning by doing" and "learning by reflecting" (Barth, 2015, pp. 94).

These concepts are also central in critical pedagogy, in particular Freire's (1972) notion of 'problem-posing' education and the creation of counter-hegemonies (see section 3.2). Transformative learning theories (see section 3.2.2) also make use of these four pedagogical 'tendencies', or approaches, in the steps they suggest for the learning process as for instance suggested by Mezirow (1990; 2000) or Koller (2017).

[306] e.g. éducation21, no date; UNESCO, 2017a; Sterling, 1996; Künzli David & Bertschy, 2012; Barth, 2016 ; Cotton & Winter, 2010.
[307] e.g. éducation21, no date; UNESCO, 2017a; OECD & AsiaSociety, 2018; Künzli David & Bertschy, 2012; Wals, 2017; Cotton & Winter, 2010.
[308] e.g. OECD & AsiaSociety, 2018; Sterling, 1996; Barth, 2016; Wals, 2017; Cotton & Winter, 2010.
[309] e.g. éducation21, no date; UNESCO, 2017a; Künzli David & Bertschy, 2012; Barth, 2016.
[310] e.g. éducation21, no date; UNESCO, 2017a; OECD & AsiaSociety, 2018; Sterling, 1996.
[311] e.g. éducation21, no date; UNESCO, 2017a; Sterling, 1996; Künzli David & Bertschy, 2012.
[312] e.g. UNESCO, 2017a; Sterling, 1996; Wals, 2017; Cotton & Winter, 2010.
[313] e.g. éducation21, no date; UNESCO, 2017a; Sterling, 1996; Barth, 2016.
[314] e.g. UNESCO, 2017a; OECD & AsiaSociety, 2018; Barth, 2016; Wals, 2017; Cotton & Winter, 2010.
[315] e.g. éducation21, no date; UNESCO, 2017a; OECD & AsiaSociety, 2018; Künzli David & Bertschy, 2012; Wals, 2017; Cotton & Winter, 2010.
[316] e.g. UNESCO, 2017a; OECD & AsiaSociety, 2018; Sterling, 1996; Cotton & Winter, 2010.

7.2 Practical perspectives on pedagogical approaches

As in the previous two chapters, which focused on knowledge elements and competency components, this section concerns itself with practical perspectives on pedagogical approaches. It will present the empirical results in a condensed manner while displaying only key, representative ('anchoring') quotations and referring to the underlying source of data in the form of footnotes. As explained in the previous chapter, the positions of both the experts and the case studies will be presented as unified.

The results in this section will be presented according to the two empirical categories of pedagogical approaches - *critical reflection (section 7.2.1)* and *transformative action (7.2.3)*. The categories are, however, interrelated, as the following quotation suggests:

> *"I would like to place two things in a mutual relation: To initiate change process in learners, two things are needed. Learners need to experience things and to reflect these experiences. Or they need to reflect first and in the next step experience."*
> *(E_REF1: Experts_4: 77)*

Unlike the other two sections on practical perspectives (section 5.2 and 6.2), due to the overlaps between the pedagogical approaches in both *critical reflection* and *transformative action*, the list of key pedagogical approaches will not be displayed at the end of the two categories but instead in section 7.2.3, 'key pedagogical approaches', including some more detailed examples.

7.2.1 Fostering critical reflection[317]

This category is all about reflective processes. In this category, both the experts and the case studies refer to how educational opportunities should foster reflection and critical thinking among the learners, and which pedagogical approaches are useful for such processes. Moreover, they suggest fostering personal orientation and self-care as well as enabling the consideration of alternatives.

One domain of pedagogical approaches in this category includes those that *foster reflection and critique* among the learners. Both the experts and the case studies refer to fostering awareness via intense phases of reflection on unsustainability and so far not reflected assumptions about for instance consumption patterns in their daily life[318]. This includes reflecting about one's 'inner

[317] This category (REF) contains of the following codes: CS_REF1_Foster critical reflection, maturity and responsibility; E_REF1_Foster critical reflection of themes, social imaginary, experiences & good life; CS_REF2_Fostering personal orientation and self-care; CS_REF3_Enabling emotional and non-academic knowledge; E_REF2_Mindfulness training, nature experience; CS_REF4_Cooperative and collective learning without hierarchies; E_REF3_Connecting to daily life, themes & needs of learners; CS_REF5_Enabling awareness of alternative projects and themes; E_REF4_Enabling awareness of alternative places, people and projects

[318] CS_REF1: Pip_1: 64

drivers'[319] and the mental infrastructures or the social imaginary of economic growth[320].

They suggest that such intense reflections among the learners can foster both the acquisition of critical competency components and critical knowledge elements. Therefore, in this category, the pedagogical approaches focus on how critical abilities (see section 6.1) and the acquisition of critical knowledge, such as the causes of unsustainability (see section 5.1), can be fostered. Moreover, the experts argue, that, on the one hand, learners' reflections are a precondition to criticize the imprint of economic growth in their own life such as critically asking themselves what is really needed for a good life in material perspectives[321]. On the other hand such reflections could enable them to anticipate alternatives, utopias and visions.

Pedagogical approaches to fostering these intense phases of reflection among learners could be those that enable the dynamic interplay between reflection and action, e.g. in the form of outdoor education, "like thinking about certain topics while hiking"[322] (more examples will be given in section 7.2.3).

Another domain of pedagogical approaches in this section is built by those that *foster personal orientation, self-awareness and self-care*. The case studies argue that such approaches are necessary because formal school education in its current form first of all fosters mainly competitive values and can lead learners to become alienated from their own interests and to make them follow the dominant patterns of the social imaginary and related behavior rather than question and critique them[323].

> *"Pedagogical approaches that follow personal experience and personal processes beyond the logic of exploitation have a huge potential and could release so much energy that would contribute to the development of people's critical capacities."*
> *(CS_REF2: Chris_1: 76)*

Pedagogical approaches to fostering such personal orientation and self-awareness as suggested by both case studies and experts include, for instance, emotional approaches to knowing and "sensing things that are going on"[324], nature experiences[325] and mindfulness trainings with the aim to decelerate people's lives, calming down and reducing stress[326]. Moreover, the case studies suggest that a focus on other forms of (non-academic) knowledge and the value of such other knowledge can support such processes of personal orientation[327].

[319] CS_REF1: Chris_2: 70
[320] E_REF1: Experts_4: 37
[321] E_REF1: Experts_4: 86
[322] E_REF1: Experts_4: 80
[323] CS_REF2: Tal_2: 92
[324] CS_REF3: Blair_1: 48
[325] E_REF2: Experts_4: 80
[326] E_REF2: Experts_4: 78
[327] CS_REF3: Alexis_2: 43

For more collaboration[328] instead of competition among the learners, the cases studies highlight that pedagogical approaches should include cooperative and collective learning[329] without hierarchies, in which everybody can learn from each other[330]. The experts stress the necessity of connecting to the daily life, personal issues or themes, and needs of the learners in order to respect their realities.[331] Examples of how to do so, as suggested by the experts, range from cooking events with 'saved food', to broader notions of engaging learners that are themselves part of the economic processes and means of production - for instance in a traineeship - and thus directly part of the logic of growth and exploitation.[332]

Yet another domain of pedagogical approaches in this category encompasses those that enable the *consideration of economic alternative projects, places and projects*. These approaches strongly overlap with the next category, *transformative action*, because the alternatives are not only useful to reflect for instance on alternative lifestyles[333], but also enable the learners to experience these alternatives.

Reflective aspects of the approach to consider economic (and lifestyle) alternatives includes giving a 'positive message', because, the case studies argue, the motivation to participate in degrowth alternatives develops when learners feel sympathy for the degrowth movement[334]. Thus, they argue, degrowth should not be approached as a 'shocking' moment of downscaling and personal restrictions, but instead should be part of a 'positive' message in the creative consideration of alternatives.

The experts suggest detailed pedagogical approaches, such as the 'week of change' and a 'congress for solidarity economy'[335], both of which are formats where learners have the chance to get to know a variety of alternatives in a condensed way. Others formats are, for instance, "decentralized seminars to get to know and consider alternatives, such as economic collectives or repair cafés through bicycle tours and transition tours".[336] Such seminars simultaneously foster both critical reflection and transformative action and dovetail nicely with the second category of pedagogical approaches, fostering transformative action – as described in the following section 7.2.2.

[328] CS_REF4: Jody_2: 84
[329] CS_REF4: Vanja_1: 88
[330] CS_REF4: Chris_1: 80
[331] E_REF3: Experts_4: 90
[332] E_REF3: Experts_4: 96
[333] CS_REF5: Tal_1: 12
[334] CS_REF5: Jody_1: 40
[335] E_REF4: Experts_4: 19
[336] E_REF4: Experts_4: 51

7.2.2 Fostering transformative action[337]

This category is focused on transformative activities. In this category, both the experts and case studies refer to how pedagogical approaches should foster situated, experiential and action-oriented learning, how they should create emancipatory spaces for individual and collective experiments and for unlearning unsustainability. Moreover, they suggest how pedagogical approaches should foster political action with stakeholders.

One domain of pedagogical approaches in this category are those that *foster situated, experiential and action-oriented learning*. The case studies and the experts highlight that learning should be based on experiences[338] because it enables the building of links to one's own life[339]. The experts assume that such practical work, on personal topics such as reducing waste and ecological footprints[340], fosters reflection and exchange with other learners.

In the context of degrowth, such experiences could be workshops to practice self-sufficiency and subsistence[341] and practical change processes on a small scale that could be initiated in the educational process and foster potential participation in socio-ecological transformations and degrowth projects based on the experience.

Another domain of pedagogical approaches encompasses those that *create an emancipatory space for experiments, trial and error and for developing utopias*. Both experts and case studies highlight how important emancipatory spaces are in the context of degrowth. Such spaces include ideological but also physical spaces. It is suggested that space for "trial and error and dreaming are missing in today's education[342] but that they are a precondition for individual and collective experiments. Often, such emancipatory space is connected to notions of experimenting and to developing utopian ideas for concrete projects of the learners[343]. They should be both active and reflective spaces, open to results[344] on a voluntary, not indoctrinating base[345] and enable the learners to develop different points of view on the problem of growth[346].

Such emancipatory spaces may be useful for unlearning certain lifestyle 'habits' or dependencies through exposure to other, alternative patterns that are enabled in the critical spaces[347]:

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[337] This category (ACT) contains of the following codes: CS_ACT1_Experiential methods & change projects; E_ACT1_Experiential methods to foster participation & experiences; CS_ACT2_Creating emancipatory space for trial and error; E_ACT2_Creating emancipatory space for experiments & developing utopia; CS_ACT3_Fostering critical unlearning in learners' lifestyle; E_ACT3_Fostering individual & collective experiments with alternative economies & sustainable lifestyles; CS_ACT4_Enabling collective negotiation and autonomous organization; E_ACT4_Fostering (political) action in local context with stakeholders

[338] CS_ACT1: Jody_2: 120

[339] CS_ACT1: Celeste_2: 97

[340] E_ACT1: Experts_4: 19

[341] E_ACT1: Experts_4: 60

[342] CS_ACT2: Vanja_1: 22

[343] CS_ACT2: Terry_2: 26

[344] E_ACT2: Experts_4: 77

[345] CS_ACT3: Noor_1: 50

[346] E_ACT2: Experts_4: 28

[347] CS_ACT3: Celeste_2: 115

"Pedagogical approaches should foster practical projects in alternative economies. Not only to talk about it but to actually experience them and to study economic models such as commons, pluralist economy, 'economy for the common good' - to compare them and to maybe write a degrowth diary or growth diary and to study one's own drivers of growth and related mechanisms such as happiness, limits, resonance etc."
(E_ACT3: Experts_4: 56)

The quotation above suggests that unlearning of lifestyle habits can be fostered by individual and collective experiments with alternative economies or sustainable experiments in daily life. Such unlearning in practical experiences can be supported by intense reflections on the personal processes that occur during the experience. Aside from the degrowth/growth diary suggested in the quote above, more specific examples of pedagogical approaches to doing so that were suggested by experts and cases studies include CO_2-diaries, which help individuals to not only reflect on their own footprint but also to see the limits of one's own impact[348], local sharing networks in the school or in the neighborhood[349], zero waste projects, living one month without money[350] or social gardening with a focus on community[351].

Another important use of such emancipatory spaces and considering alternatives is to experiment also in a social and collective way. Thus, other examples of pedagogical approaches suggested by the experts and case studies include collaborative mobility[352] as well as collective and autonomous organization in a specific project[353] to enable mindful social relations[354]. Here, emancipatory (collective) space for degrowth projects is considered as a precondition for the development of critical social abilities.

Another domain of pedagogical approaches encompasses those that *foster political action with stakeholders*. Examples of such approaches include enabling participation in politics with local stakeholders, by working, for instance, in political institutions on the municipal level[355] on projects for climate protection[356], or else organizing regional action days on topics such as sustainable mobility[357]. Other ideas that are influenced by municipal politics range from on-campus service learning, such as designing an entire solar system[358], to campaign strategies and action training related to a local political conflict[359].

[348] E_ACT3: Experts_4: 37
[349] E_ACT3: Experts_4: 43
[350] E_ACT3: Experts_4: 86
[351] E_ACT3: Experts_4: 77
[352] E_ACT3: Experts_4: 78
[353] CS_ACT4: Vanja_1: 80
[354] CS_ACT4: Addison_2: 130; CS_ACT4: Terry_2: 14
[355] E_ACT4: Experts_4: 58
[356] E_ACT4: Experts_4: 28
[357] E_ACT4: Experts_4: 43
[358] E_ACT4: Experts_4: 48
[359] E_ACT4: Experts_4: 73

7.2.3 Key pedagogical approaches

Building on the two categories and sections for pedagogical approaches above, the following section suggests key pedagogical approaches from the degrowth-informed educational practice that address both, *critical reflection* and *transformative action*.

The broader pedagogical approaches named here classify the detailed examples that were mentioned by the experts and case studies in the data collection. The examples reflect the focus of the educational programs that the participants of the case studies were part of, but they reflect also the experience and expertise of the experts of the degrowth-informed educational practice that were invited to the expert workshop. The examples are not intended to be exhaustive.

Excursions to economic alternatives and degrowth lifestyles

This pedagogical approach was mentioned frequently by both case studies and experts. In one of the programs of elaboration – 'FreiRaum' – it was explicitly part of the seminar weeks to visit and get to know economic alternatives and transition projects, such as upcycling workshops, or social gardening projects.

The idea behind such approaches is to allow learners get to know, consider and reflect on economic (and lifestyle) alternatives while also getting in touch with those who live them. Such 'pioneers' can inspire and motivate the learners to apply a different perspective on the 'standard' lifestyle and to economic routines they are used to. In this way, such excursions perfectly combine both of the categories as suggested above: *transformative action* and *critical reflection*, which takes place afterwards, or in the documentation of such excursions.

Key examples for such excursions into economic alternatives and lifestyles that were suggested by the experts and case studies from the degrowth-informed educational practice are: project weeks with excursions to local 'pioneers', congresses for alternative economies, decentralized seminars teaching about economic alternatives and collectives, 'transition tours' – a format in which, for instance, hiking, camping tours or bicycle tours are combined with excursions to alternative projects, or else urban tours or city walks, including visits to economic alternatives in cities.

Individual or collective self-experiments in degrowth

The pedagogical approach of individual or collective self-experiments was thematized by the experts in particular. The pedagogical logic underpinning such self-experiments is that learners are required to critically consider, research and reflect on their own lifestyle or behavior patterns. Within such experiments, they actively try out alternative ways of dealing with certain issues, often in the

sphere of consumption. The other part of such self-experiments is being self-aware and reflecting intensively on questions like "what does it do to me?", and observing the effect it has on one's own mental infrastructures. Subsequently, such pedagogical approaches enable the creative consideration of alternatives and offer opportunities for lifestyle changes on a voluntary base. While connecting to the daily life of the learners, such approaches furthermore enable collaborative, situated and experiential forms of learning.

Specific examples for such individual or collective self-experiments and/or research on one's own lifestyles that were suggested by the experts (and the case studies) from the degrowth-informed educational practice are: Slow travel - for instance, with the bicycle or by foot instead of using trains, buses or even airplanes; CO_2-diaries for assess one's own ecological footprint; lifecycle analyses of materials of daily use; experiments in living without money, experiments in zero waste (including avoiding, upcycling and re-using materials and also social experiments in collaborative mobility), for instance with the goal of reducing one's own individual footprint.

One example that is especially related to degrowth is writing a 'degrowth diary' or 'growth diary' to study one's own drivers of growth and related mechanisms and at the same time reflecting on and documenting happiness, limits, resonance, etc.

Critical-emancipatory spaces for degrowth

This pedagogical approach was frequently suggested by experts and case studies. It was suggested that either educators should provide such critical-emancipatory spaces for the learners in which they can fully develop their degrowth-related ideas – or else that learners should organize such emancipatory spaces themselves.

There are no detailed examples of formats and methods because such spaces can be opened in basically any format. As section 7.2.2 shows, the experts and case studies suggested that the value of such spaces can be seen in different ways: they can be used for intense phases of reflections, for collective considerations of alternatives or for planning and implementing small-scale degrowth projects. Moreover, on the level of social interaction such spaces can be used for enabling cooperative and collaborative forms of learning and profound social relations.

Moreover, these spaces, for instance in a self-organized congress for solidary economy, can simply function to open up a 'safe' space for trial and error, for experimenting and developing utopian ideas, or for enabling collective and autonomous organization. In such 'safe' spaces, learners can moreover attempt 'small-scale resistance' against hierarchies: If the educators are willing to provide such spaces, then relationships between the learners and the educators can

be criticized and the (hidden) hierarchies can be used as a starting point for broader societal form of criticism and reflections.

Theater pedagogy on the social imaginary and mindfulness trainings

This pedagogical approach was especially prevalent in contributions by the case studies participants who were part of the 'theater workshop', one of the programs of exploration in the data collection. However, some of the experts also focused on such approaches due to their professional background.

The term 'mindfulness' is used in psychological or pedagogical contexts to describe moments of special attention or consciousness to a certain topic, object or social phenomenon. Examples for training and experiencing mindfulness were given by the experts in the form of, for instance, slow travel or slow food – events when mobility and consumption are experienced at a different, slower pace, enabling more intense sensory appreciation of the moment and intense reflections about the usual, fast pace of such activities in their daily life.

Using the methods and formats of theater pedagogy in combination with the social imaginary combines creative physical and mental experiences with intense phases of reflection. In the theater workshop as implemented by '*Konzeptwerk neue Ökonomie'* and *'Transition Theater'*, the participants underwent practical experiences and reflected intensively on their personal mental infrastructures while embedding such personal reflections in the theoretical framework of degrowth. Detailed pedagogical approaches, that were applied included emotional approaches, perspective changes, nature experiences, experimenting with social dynamics and the theater of the oppressed's "cop in the head" method[360] (Boal, 1990, p. 35).

Collective self-organized change projects with alternative economies

This pedagogical approach includes the fostering of small-scale change projects (in the context of degrowth) that can be initiated by the learners when educational opportunities open up spaces for this (see above). This was the case in three out of the four programs that were part of the sample of this study. In the projects '*Freiraum'*, '*euforia'* and in the '*project class'*, the learners were empowered and supported to implement smaller change processes in groups.

Detailed examples of formats and methods that were suggested by the experts and case studies from the degrowth-informed educational practice include, for instance, organizing regional action days, cooking events with 'saved food', social gardening projects, local sharing networks or sharing events,

[360] 'The Cop in the Head' comes from the theatre of the oppressed, developed by Augusto Boal. According to Boal (1990) it "concerns those oppressions that have been internalized. We usually work on the boundaries of politics, using theatre of the oppressed techniques to study specific events such as how to organize a strike. There are many people who dare not participate in a strike or other political actions. Why? Because they have cops in their heads. They have internalized their oppressions. The cops are in their heads, but the headquarters of these cops are in the reality. It is necessary to locate both the cops and their headquarters. In this instance, we are at the border of psychology, but always on the side of theatre" (Boal, 1990, p. 35).

upcycling workshops, repair cafés, or a 'week of change' - a week in which different projects, strategies and topics of socio-ecological transformation and degrowth are considered.

Such collective, self-organized change projects with alternative economies can also be considered on the larger scale of economic organization, such as initiating experiments with local currencies (such as is intended in one of the 'change projects' in the 'euforia' project that was part of the empirical analysis.

Political degrowth action with stakeholders (in a local context)

This pedagogical approach was particularly prevalent in the experts' contributions. It includes different levels of political involvement for the learners – from anticipating or reflecting a local problem or conflict, to developing utopian ideas for socio-ecological transformations on the systemic level, right up to the potential implementation of such political ideas by either working together with local stakeholders from society and politics or by directly working in political institutions on the municipal level. The pedagogical focus here lies on autonomous and collective self-organization.

More detailed examples of formats and methods that were suggested by the experts and cases studies from the degrowth-informed educational practice include, for instance, contributing to a municipal project for climate protection, or else service learning in the community or on the campus – such as designing an entire solar system, learning campaign and action strategies on a previously identified economic or political problem or conflict. The specific methods they suggested were critical media analysis and simulation games, or else role plays for the practical work in political institutions.

More specific to degrowth and its activist-based social movement, political action (instead of talking) was also described as including demonstrations and actions of resistance in either educational institutions or in the public sphere.

7.3 Discussion of pedagogical approaches

The first section of this chapter (7.1) introduced the relevant theoretical perspectives on pedagogical approaches from the ESD community, while the second section (7.2) explored the practical perspectives of the degrowth-informed educational practice on the same. This final section will build upon and synthesize both of these in order to discuss and draw conclusions to the fifth research question: Which pedagogical approaches from the degrowth-informed educational practice should be integrated into ESD?

There are two empirical categories from the degrowth-informed educational practice - *fostering critical reflection* and *fostering transformative action*. They relate to the theoretical debate in ESD (see section 7.2) on pedagogical approaches in that the two categories are closely intertwined.

The first category, *fostering critical reflection* (section 7.2.1), encompasses many pedagogical approaches that are well-known in ESD (see section 7.1; e.g. Sterling, 1996; Künzli David & Bertschy, 2012, p. 42; Wals, 2017, p. 21; éducation21, no date). Sterling, for instance, suggests certain reflective methodologies such as "the clarification and judgment of values; ideology critique; critical reflection and creative thinking [and] sensory and empathetic exercises" (Sterling, 1996, p. 35). It is clear, then, that critical thinking and reflection alone are in no way specific to degrowth. For degrowth-informed ESD, *fostering critical reflection* should be embedded in knowledge elements that are also known from the theoretical degrowth debate, such as the "slowing down [of] life's pace" (Demaria et al, 2013, p. 202).

The second category, *fostering transformative action* (section 7.2.2), also displays many links with the ESD debate on pedagogical approaches (section 7.1). This category concerns itself with situated, experiential approaches, and action-oriented and problem-based learning. Such approaches feature extensively in the ESD literature (e.g. Sterling, 1996; Cotton & Winter, 2010; Künzli David & Bertschy, 2012, p. 42; Wals, 2017, éducation21, no date).

Various theoretical ESD approaches that were introduced in section 7.1 (e.g. Sterling, 1996; Cotton & Winter, 2010; Künzli David & Bertschy, 2012; Barth, 2015; éducation21, no date; UNESCO, 2017a; OECD & Asia Society, 2018) showed that pedagogy in ESD can be classified according to four elements: *Action, which* deals with exploration, experience and problem-based learning; *reflection,* which focuses on the clarification of values, visioning and critique; *autonomy,* which relates to empowerment and individuality, and *collaboration*, which addresses networking and interaction, as well as participation and local application.

The practical perspectives on pedagogical approaches from the degrowth-informed educational practice display remarkable parallels with these four elements of ESD pedagogy. The two empirical categories *fostering critical reflection* and *fostering transformative action*, for instance, have

obvious explicit parallels with the pedagogical tendencies from ESD, *reflection* and *action,* which were identified in section 7.1. The two empirical categories also have, however, implicit connections with the pedagogical tendencies *autonomy* and *collaboration*, given that critical reflection relies on a certain level of autonomy, and collaboration is indispensable to problem-based and experiential learning.

To foster *reflection, action, autonomy* and *collaboration* in the educational practice, the theoretical debate of ESD frequently highlights the value of situated and problem-based approaches, as well as transformative learning (see Künzli David & Bertschy, 2012; Barth, 2015; éducation21, 2016; UNESCO, 2017a). Approaches similar to these three can be observed throughout the empirical results of this thesis. Transformative learning's 10 steps (see section 3.2.2, Mezirow, 2000), for instance, resemble the empirical results in that they are partly reflective and partly action-oriented, while focusing on both the individual and the collective side of the learning process.

The value of transformative learning processes in the context of degrowth was already suggested in sections 3.2.2 and 3.3. Processes of transformative learning can potentially challenge and change a learner's alienated social imaginary by provoking irritation, crises and a shift in "meaning perspectives" (Mezirow, 2000, p. 7). Getzin and Singer-Brodowski suggest that in transformative learning within the context of degrowth, learning processes that begin with a "disorienting dilemma", can shift the meaning perspective of the learners (see Mezirow, 2000) and consequently support the process of unlearning problematic, hegemonic patterns of thinking that favor economic growth. Moreover, transformative learning can open up an emancipatory space for the learners, enabling collective self-organization and collective experiments, in which everyone is responsible for the process (see Getzin & Singer-Brodowski, 2016). In doing so, transformative learning addresses ESD's four pedagogical tendencies – *reflection, action, autonomy and collaboration*. Transformative learning has already proven successful when implemented in both ESD and degrowth contexts. This suggests that there may indeed be more space in ESD for similarly emancipatory concepts already in use in degrowth.

In section 7.2.2, the key pedagogical approaches that emerged from the two (sometimes overlapping) categories *fostering critical reflection* and *fostering transformative action* were displayed in a condensed manner, based on the detailed examples given by the experts and case studies, including some explanations as to their value in the educational process. They are: 'excursions to economic alternatives and degrowth lifestyles', 'individual or collective self-experiments in degrowth', 'critical-emancipatory spaces for degrowth', 'theater pedagogy on the social imaginary and mindfulness trainings', 'collective self-organized change projects with alternative economies' and 'political degrowth action with stakeholders (in a local context)'. Most of these key pedagogical approaches are to be found in the theoretical ESD debate.

At the beginning of the theoretical section of this chapter (7.1), some fundamentals on pedagogical approaches in ESD were given. The function of learning, as conceptualized in the GAP, is to facilitate "exploratory, action-oriented and transformative learning" (UNESCO, 2014c, p. 12). This description applies to all the key pedagogical approaches suggested in section 7.2.2. Moreover, the notion that "sustainability becomes an educational design challenge" (Wals, 2015, p. 17) and that thus, learning processes can only be facilitated rather than taught directly, also relates to nearly all the examples given in the practical section above.

Most of the key pedagogical approaches given in section 7.2 are also mirrored in the characteristics for 'strong' ESD suggested by Sterling: they are, for instance, "critical", "balancing", "systemic and connective" and "ethical" (Sterling, 1996, p. 35). Often, the focus in the key pedagogical approaches of this study is on the critical individual or collective process, as in the 'critical-emancipatory spaces for degrowth' or in 'individual or collective self-experiments in degrowth'. Sterling also suggest that another characteristic for 'strong' ESD is being "process oriented and empowering rather than product oriented" (ibid.). This relates to most of the key pedagogical approaches mentioned in the results, although some are not only process-oriented but also oriented towards creating a final 'product', as is self-evident in 'collective self-organized change projects with alternative economies'.

Another parallel between the empirical results and ESD theories is their sharing of the three "key principles" suggested by Barth (2015, pp. 94) and the key pedagogical approaches suggested in section 7.2.3. Nearly all of these pedagogical approaches align with the principles "[s]elf-directed learning", "[c]ollaborative learning" and "[p]roblem-oriented learning" (ibid.)

The detailed suggestions of pedagogical approaches from the degrowth-informed educational practice also relate directly to the theoretical contributions of ESD. For instance, in the UNESCO publication on education for the SDGs appear formats and methods such as "real-world projects", "service-learning projects", "community-based research projects" and "[c]ritical and reflective thinking" (UNESCO, 2017a, pp. 54), all of which are encapsulated in the key pedagogical approaches suggested in section 7.2.

The results of this chapter can also be considered in light of the theoretical contributions of the degrowth debate, particularly with reference to how they should be integrated into ESD. In the theoretical chapter on degrowth (Chapter 2), a variety of suggestions were provided as to how different aspects of degrowth can be made use of in the educational context. One suggestion is how knowledge of, for instance, growth-critical fundamentals such as thermodynamics, the monetary system and the dynamics of capitalism (section 2.1) could be fostered in 'critical-emancipatory spaces for degrowth' (a key pedagogical approach given in section 7.2) in, for instance, project weeks. Marx' analyses in particular may shed light on the complexity inherent in the

relationship between natural phenomena, economic activity, and its social and psychological effects. This works well with the abovementioned 'critical-emancipatory spaces', as the intense reflection processes on topics, such as social exploitation, can then be used to develop collective strategies for creating positive change in learners' own lives.

The results of key pedagogical approaches (section 7.2.3) could also contribute to degrowth-informed ESD in deconstructing and tackling the ideologies which are dominated by the paradigm of growth and hierarchical power relations (see section 2.3). Especially key pedagogical approaches that prompt deep consideration of lifestyles and behavioral patterns, such as 'individual or collective self-experiments in degrowth', could be extremely valuable in enabling learners to emancipate themselves from the "'iron cage' of consumerism" (Jackson, 2009, p. 87) through the observation, reflection upon and consequent alteration of their own consumption behavior.

In the discussion at the end of the previous chapter (section 6.3), it was suggested that "resonance capacity" (Rosa, 2016, p. 418, my translation) should be integrated into ESD, specifically in the context of competency components. The concept of resonance is, however, also relevant to pedagogical approaches because, as Rosa argues, many educational settings are "devitalizing zones of alienation" which need to be creatively and unconventionally shifted (Rosa 2016, pp. 416, my translation). All the collective processes that are part of the key pedagogical approaches from section 7.2.3, such as 'collective self-organized change processes with alternative economies', 'theater pedagogy on the social imaginary and mindfulness trainings' could potentially contribute to such shifts by providing 'axes of resonance' (Rosa, 2016, pp. 402; Rosa & Endres, 2016, pp. 46), such as profound social interactions that offer opportunities to counter alienation (Rosa 2016, p. 412).

Muraca's three dimensions of transformations in the context of degrowth are applicable not only to knowledge elements (section 5.3) and competency components (6.3), but also to pedagogical approaches. Nearly all of the key pedagogical approaches from the degrowth-informed educational practice suggested in section 7.2.3 can foster transformations on all of these three levels – the social imaginary, the level of individual and collective practices and in the political and structural dimension (Muraca, 2015). This enables learners to be active agents of social change processes, which not only promotes self-efficacy in the learning process but also contributes to making degrowth-informed ESD and its attendant education practice more impactful.

Overall, not only the two categories, *fostering critical reflection* and *fostering transformative action*, but also the the key pedagogical approaches suggested in this chapter can be useful for ESD when they are embedded in a degrowth context and linked to degrowth-specific knowledge elements (chapter 5) and competency components (chapter 6), or when they are connected to degrowth theories, such as for instance alternative economic models like

steady-state economics, doughnut economics or post-growth society (see chapter 2).

8 Discussion

The main aim of this thesis is to answer the question: *What can ESD learn from the degrowth debate?* (MRQ). Earlier, in chapter 2, the content and various positions in the degrowth debate were clarified and delineated (RQ1). Chapter 3 then explored the extent to which ESD has been informed by the degrowth debate so far (RQ2). Chapters 5, 6, and 7 discussed, respectively, which knowledge elements (RQ3), competency components (RQ4) and pedagogical approaches (RQ5) from degrowth the educational practice should be integrated into ESD.

The remainder of this thesis will first of all reflect on and discuss the methods based on a review of the quality criteria (section 8.1). Then, the overall results of this thesis will be discussed with regards to the main research question (8.2) before coming to the final conclusions (chapter 9).

8.1 Methods' reflection

The following paragraphs will reflect upon and assess the empirical process of this study with regards to its design, sampling and methods. This will be done according to the quality criteria that were suggested in section 4.5. Overall, the strategies used for meeting the quality criteria in this thesis were reasonably effective, and they could therefore be met for the most part.

The quality criterion of *objectivity* can be considered to be fully met. This was achieved by providing a transparent, detailed description of the methods, sampling strategies and procedures of the data collection in chapter 4. Objectivity is also achieved through the extensive linking of the interpretations within the triangulated categories to references in the original data in chapters 5, 6 and 7, which can be retraced in the transcripts of interviews and focus groups as referred to in the footnotes.

Moreover, this study achieved "freedom from unacknowledged researcher biases" (Miles et al. 2014, p. 311) by identifying and stating the biases and personal assumptions of the author, as is outlined in the paradigmatic assumptions and methodological considerations (section 4.3). The author is aware of the fact that her own values, assumptions and biases unavoidably impacted on the process of the study and that they resemble those of the perspective of degrowth and its normative implications. However, making researchers' assumptions transparent is typical of any qualitative research process and doing so does not interfere with the objectivity of this thesis.

The quality criterion of *reliability* can be considered to be mostly met. The main strategy employed in order to achieve consistency and traceability of the process is intercoder reliability. Regular colloquium and working group presentations, as well as weekly meetings with a group of peer-colleague

researchers (German: '*Forschungswerkstatt'*) accompanied the phase of data analysis and interpretation. The data quality and analytic quality was ensured and monitored by collective coding in the '*Forschungswerkstatt'* and by team-coding for reliability checks of parts of the data (Miles et al., 2014, p. 84). Intercoder reliability was checked by consensual coding (Kuckartz, 2014, p. 74) with a second coder (peer researcher) for approximately 10% of the data. The base for the consensual coding was an extract from the MaxQDA software file, the code system and the codebook, including typical data examples for each code (see appendix). After the process of consensual coding, the status of concordance between the two coders was discussed. Where coherency was not met in particular aspects, the codes, codings or the codebook were adapted. After discussing gaps and overlaps in the two independent coding processes, the two coders estimated the percentage of intercoder reliability at over 80%, which suggests a high standard of reliability for the quality of conclusions.

The quality criterion of *internal validity/credibility* can also be seen as mostly met. The quality of the data was clarified for the research process with the use of audio-recordings of interviews, focus groups and transcriptions of the data. The transcripts were produced and conducted by two external companies following a defined set of guidelines. Double-checks for the accuracy of the transcripts were conducted by the author in random samples. The audio-files were synchronized with the transcript files using MaxQDA12 software as a second check for accuracy.

Consistency in the codings, which is crucial to this study's internal validity/credibility, is indicated in the codebook, codes and in the way the categories are precisely defined and well-structured, with examples given for each code and category. The entire analytic process was conducted over three rounds of coding, in order to determine the most effective final coding and category system.

The triangulation of categories from the different data sources aims to improve the conclusions by enabling a review of the internal validity/credibility of the results (see Flick, 2014b, p. 422). However, adaptations to the triangulation were applied. The vast majority of categories was triangulated from both parts of the data, experts' data and case studies' data. Because the case studies' data is based on 34 interviews, the minimum number of data sources that should be used in triangulation was comfortably met in all categories with the exception of three categories that could only be reconstructed from the experts' data.[361] Whenever triangulation was not possible, it was made transparent in the results.

The quality criterion of *external validity* can also be considered to be mostly met. As indicated in section 4.5, this study's design and its presentation aim to ensure its generalizability. The most important component of this standard is a transparent sampling strategy. The sampling was carefully conducted

[361] See the categories 'the limits and consequences of economic growth', 'social imaginary and culture' and 'political and systemic competency components'.

as to ensure contrast and diversity between the programs, individuals and experts (see sections 4.3.1 and 4.3.2). The sampling strategy was however pragmatically limited because the selected experts were German-speaking and the programs chosen were in German only. The limitation of this approach is that the reconstructed knowledge elements, competency components and pedagogical approaches are perhaps over-representative of the present debates in the German-speaking degrowth & ESD community.

Another limitation is that the critical discourses of justice, perspectives from the Global South or feminist perspectives are underrepresented in both the sampling and data. That aspects of justice are mentioned (although not in a very detailed manner) indicates that the sample was theoretically diverse enough to include these aspects in the data, albeit only somewhat superficially. The concluding chapter (Chapter 10) makes suggestions for further research to address this limitation.

Another aspect that must be critically reflected upon is how the respective sampling and structuring of the two research units shaped the data body. The resulting categories are therefore, by the same process, 'biased'. While the experts contributed more to the data on knowledge elements and pedagogical approaches, the case study participants contributed more to the data concerning competency components, in particular the issues of normativity and the psychological foundation of learners' personal lives. A positive outcome of this is that both research units are more or less equally represented in the data and contribute to the results to a similar extent, even complementing each other in many cases.

The experts' data, however, is inexorably shaped by the structure of the expert workshop. The focus groups of the expert workshop were pre-structured according to Muraca's three dimensions of transformation, and thus divided into the social imaginary, individual and collective practices and the political and structural dimensions (Muraca, 2015). The idea was to classify the experts' brainstorming of both knowledge elements and competency components according to these three dimensions. Prior to the workshop, the experts were introduced to Muraca's model in the concept paper (Getzin, 2016, unpublished), which was part of the experts' preparation for the workshop. During the workshop, absorbing discussions took place about the applicability of these three dimensions in the context of collecting knowledge elements and competency components[362]. There was no consensus among the experts as to whether these dimensions are useful or not. Some felt that "the perspective and the dimensions of Muraca are a transformative perspective of degrowth but not an educational perspective and therefore the two perspectives cannot be matched"[363]. Due to the lack of consensus on the value of Muraca's dimensions in that context, the idea of using them in the process of data analysis was abandoned.

[362] Experts_2: 92
[363] Experts_1: 104

However, and perhaps unsurprisingly, vestiges of this initial attempt to structure the data collection according to Muraca's three dimensions are imprinted in the data body (see sections 5.3, 6.3 and 7.3).

The case studies' data, too, is shaped by the sampling strategy used, as well as the design and structure of the four educational programs. The participants of the 'Theater Workshop', for instance, highlighted the normative aspects and the psychological foundation of competency components in particular. This can be traced back to the reflective methods applied in the '*Theater workshop'* (see section 7.2.3). The participants of '*FreiRaum'* emphasized the value of small-scale change projects, which reflects the format of the '*FreiRaum'* seminars that enabled them to implement such small projects themselves, such as gardening projects and sharing networks. The participants of the 'project class', by contrast, contributed to all categories equally, but their contributions were not very degrowth-specific. This reflects the fact that their program was not focused on degrowth but rather on theoretical sustainability input and the implementation of practical sustainability projects. The participants of 'imp!act' were different again. Although the program itself was not particularly growth-critical, the two selected interviewees were. They live what they call sustainable and 'authentic' lifestyles and have much experience in doing so. Consequently, they contributed significantly to categories dealing with alternatives on the individual and collective level and particularly alternative lifestyles.

Utilization, the final quality criterion, can be seen as fully met. Utilization is ensured by enabling the drawing of constructive conclusions for the research and practice of ESD.

In terms of the broader empirical design of this thesis, the overall structure of the data collection in regards to the three constituent parts of ESD – knowledge elements, competency components and pedagogical approaches – should be reflected upon. The focus on the three constituent parts that was used in order to explore the main research question, 'what ESD can learn from the degrowth debate', proved valuable for this thesis. As the following discussion (section 8.2) will explore, the results show that there is much within the degrowth-informed educational practice that could be profitably integrated into ESD. Nevertheless, the design of this study is limited in that other constituent parts of ESD, that were not addressed here, may also potentially benefit from incorporating aspects of degrowth. This is perhaps something further studies might address.

Moreover, in the discussion, further ideas for research are suggested so that future research can benefit from this thesis' findings. The results therefore have a clear political dimension and are thus utilizable because they aim to support the educational and more general project of socio-ecological transformation.

8.2 What can ESD learn from the degrowth debate?

The following section will discuss the overall empirical results of this thesis with regards to the main research question, which is: What can ESD learn from the degrowth debate? Unlike the more detailed discussions in chapters 5-7, which discussed the knowledge elements, competency components and pedagogical approaches that appeared in the results with their respective theoretical models of ESD, in that which follows, the broader perspectives of the degrowth debate (chapter 2) and critical ESD (chapter 3) will be considered and discussed, in order to better understand the overall trends of the results.

The base assumption underpinning this thesis is that mainstream ESD in its policies, scientific publications and educational materials often displays an uncritical approach to sustainable development. In many cases, ESD adheres, perhaps too closely, to the Brundtland definition of sustainable development. The introduction to this thesis, as well as section 2.2, have demonstrated how in both the Brundtland definition and 'weak' models of sustainability, economic growth not only remains unquestioned, but is actively prioritized. Economic capital is assumed to be of equal importance as both social and ecological capitals (Ott et al., 2011).

Not only most of those in ESD, but also the majority of positions in the general SD debate adhere to both the Brundtland definition and 'weak' sustainability models. Section 2.2.3 has shown that the different positions in sustainable development can be classified along two axes displaying the relative priority given to equality concerns on the one hand and environmental concerns on the other. These different positions can either be labeled as 'status quo' (low concern), 'reform' (medium concern) or 'transformation' (high concern) (Hopwood et al., 2004, p. 41). Official positions often favor 'status quo' or 'reform' (i.e. 'weak' sustainability). The consequence is that these positions either assume that economic growth is the continuous solution to the problems of unsustainability or, at best, that the necessary changes can be made within existing social and economic structures (ibid., pp. 42). If mainstream ESD uncritically adopts such positions from the general SD discourse into ESD's policies and publications, then it risks contributing to unsustainability rather than combating it by providing 'strong' sustainable solutions.

Both the introduction and chapter 2 also explored the ways in which biophysical and social boundaries are already being crossed (Steffen et al., 2015b, p. 11) as a direct result of the unsustainable economic exploitation of both humans and their environment. This exploitation is driven mostly by the GDP growth of the OECD countries (ibid.). Other disciplines offer explanations of the mechanisms by which this exploitation takes place, such as the concept of thermodynamics and the 'entropy problem' (Georgescu-Roegen, 1977) taken from ecological economics; the monetary dynamics of the growth spiral with growth imperative and impetus (Binswanger, 2013); as well as the dynamics of capitalism, which result in the alienation and commodification of people

(Marx, 1993). These ideas shed the light on the limitations placed on economic action on a limited planet.

The evidence from various disciplines indicating that unlimited economic growth is the main cause of unsustainability is overwhelming. However, in spite of this evidence, many official positions still cling to the idea that economic growth can provide solutions to the environmental and social problems it engenders. From a growth-critical perspective, such positions in the SD debate are dangerously limited, as any attempt to create a sustainable future using the diesel engine of economic growth is inherently contradictory. Equally, mainstream ESD positions that accept this logic in their presuppositions and educational conceptions - although advocating for education as a driver of a sustainable future – are similarly limited and contradictory. The same applies to the majority of ideas within ESD that are not explicitly formulated as pro-economic growth, but which are vague enough in their formulation as to allow their subversion and (mis-)application by positions in favor of economic growth.

Within the growth-critical debate, degrowth in the narrower sense is unequivocally critical of not only economic growth, which it considers the main cause of unsustainability, but also of the capitalist social order, into which the growth paradigm (see section 2.3) at every level is sewn. Unlike 'status quo' or 'reform' positions, which – at best – acknowledge that adjustments within the existing system are necessary, degrowth sees the existing social and economic structures, as well as the existing power structures upon which they are built, as being the root causes of unsustainability. Thus, degrowth belongs among the 'transformation' positions (Hopwood et al., 2005, p. 41), and sees any positions that support existing systemic causes of unsustainability (either actively, by advocating for green growth for example, or else passively) as being unacceptable and themselves a barrier to meaningful change. Among these positions are those of mainstream ESD and SD.

The aim and intention of this thesis was to explore the comparatively new perspective of degrowth with regards to ESD and its general value for education. Although ESD has done much to conceptualize solutions that bring about sustainable educational practices and systems, the reality is still, in the main, contradictory and unsustainable. As a result, we need to continue thinking about how education can be more effective with regards to sustainability. This thesis contends that, by adopting or incorporating the more theoretically consistent perspective of degrowth, ESD can more successfully effect positive change regarding sustainability, as doing so would prevent ESD from being hamstrung by its theoretical inconsistency.[364]

ESD is not a unified whole with a single theoretical position, however. Chapter 3 explored in detail the remarkable body of critical literature in ESD,

[364] Experts_5: 58

as well as its more 'radical' branches. The critical ESD community has, unlike the body of official literature and the more mainstream positions it represents, pointed to the lack of systemic critique in ESD. It is therefore necessary to consider the contributions of the critical ESD community that offer transformative suggestions as to how ESD might contribute to 'strong', rather than 'weak' sustainability.

The initial intention of chapter 3 was to explore the extent to which ESD has been thus far informed by the degrowth debate. In reality, however, mainstream ESD has not at all been informed by degrowth so far, and critical ESD only to a very limited extent. However, despite having developed separately to degrowth, the critical ESD discourse raises many of the same key issues and concerns (see section 3.4). For some decades now, critical ESD scholars have criticized mainstream ESD's reliance on neoliberal logic and the growth paradigm, which they argue contribute to the unsustainable economic system (e.g. Orr, 2004; Sterling, 2017). Thus, we see something of a consensus among critical ESD scholars and degrowth. It seems the two discourses have arrived at similar conclusions by different means.

Another commonality between degrowth and ESD is their focus on the reconfiguration of social institutions. In critical ESD, this relates specifically to unsustainable practices in formal educational institutions. The critical ESD community in particular, but even also the general ESD debate, accepts that in order to contribute meaningfully to sustainability, educational institutions need to be re-configured (e.g. Selby, 2015) and re-designed in a holistic way (using, for instance, the whole-institution approach [e.g. éducation21, 2016; UNESCO, 2017a]). Building upon this assumption, upon which the ESD discourse unanimously agrees, this thesis would argue that degrowth-informed ESD can only be effective if the educational institutions fundamentally refrain from relying on the mechanisms of economic growth.

However, if it is to actually be and remain critical, degrowth-informed ESD cannot be part of formal education, be adopted by formal curricula within the current educational system or be included in educational policies as long as the requisite changes in institutions are not made and the interwoven systemic barriers to change prevail. In the current state - as long as formal educational sectors retain their inherent contradictions and growth-positive 'hidden curricula' (see section 3.1), spaces for emancipation and resistance to this logic can only be created outside of such institutions, in non-formal educational settings.

The institutional changes demanded by degrowth-informed ESD may potentially bring about promising alternative forms of education and pedagogies. Although such alternative educational pathways (e.g. Warwick, 2012) were not the primary focus of this study, it has become clear that pedagogies with a focus on community building or de-schooling could potentially enable degrowth-informed ESD to be part of a changing formal education sector, assuming the context is designed in a consistent, i.e. not contradictory, manner.

The critical ESD community, like degrowth-informed ESD, holds that the fostering of critical capacities should be at the center of educational endeavors. The need for paradigmatic changes in ESD, which the acquisition of such critical capacities may be able to address, was considered very early on in the critical debate (e.g. Sterling, 1996; 2003; 2011). If learners are capable of critically assessing dominant societal norms and routines, they may also be capable of challenging their own underlying assumptions, potentially altering prevailing routines (e.g. Wals, 2012). Many ESD authors suggest that such critical-emancipatory forms of ESD (Vare & Scott, 2007; Jickling & Wals, 2008) can be fostered using transformative learning approaches (e.g. Wals, 2015; Lotz-Sisitka et al., 2015; Getzin & Singer-Brodowski, 2016), which have the potential to contribute to the necessary shift towards a more sustainable paradigm (see Sterling, 2003; 2011).

The few explicit links that exist between ESD/education and degrowth (section 3.3) demonstrate the extent to which ESD has thus far been informed by the degrowth debate (e.g. Prádanos, 2015; Getzin & Singer-Brodowski, 2016; Rieckmann, 2017). These contributions stress the role of the social imaginary in socio-ecological transformations, which is well-known to the degrowth debate (Castoriadis, 1987; Latouche, 2015). They either emphasize that ESD/education could contribute to decolonizing the social imaginary (in terms of economic growth) (Prádanos, 2015; Getzin & Singer-Brodowski, 2016) or make use of the social imaginary in order to clarify their own values within the educational process (Rieckmann, 2017).

This thesis' detailed comparison of the critical ESD community with the degrowth debate made some important discoveries regarding the overlaps that exist between the two discourses. Most obviously, as has been demonstrated above, critical ESD is and was already implicitly related to degrowth reasoning.

This implicit relation between critical ESD and the degrowth debate becomes much clearer if the arguments from the critical ESD community are strengthened and supported by those of critical pedagogy. As was shown in Chapter 3, the apparently 'natural relationship' between critical ESD and critical pedagogy (see section 3.2.2) has rarely been made explicit in critical ESD. Likewise, there is an explicit natural relationship between degrowth and Critical Theory, on which degrowth draws heavily (see excurses 1 & 2). Degrowth itself may even be considered an emerging critical social theory.

Not only degrowth, but also critical pedagogy and sometimes even critical ESD draw on Critical Theory (Giroux, 2011). The arguments from critical ESD sometimes *explicitly* (e.g. Huckle, 1996; 2012a; 2017), and sometimes *implicitly* (e.g. Sterling, 2003; 2011; Wals, 2015) relate to Critical Theory. The familial resemblance shared by these four discourses – critical ESD, critical pedagogy, Critical Theory and degrowth – goes a long way to explaining why degrowth and critical ESD relate to each other so well when they are linked by

critical pedagogy (see also Fig. 7 in section 3.1.1). This is more than a mere side-discourse to this thesis.

There are two things that ESD can learn from degrowth in relation to the common grounds of the discourses. Firstly, these common grounds indicate (see Fig. 7 in section 3.1.1) that degrowth-informed ESD can be oriented towards the position of 'strong' sustainability (much like the critical ESD discourse) and towards 'radical' transformations (much like the critical pedagogy discourse and Critical Theory). Secondly, degrowth-informed ESD can theoretically (and practically) build on the division between *critique* and *transformation* made by degrowth and Critical Theory. This division may not only contribute to a more detailed theoretical conception of degrowth-informed ESD but also aid in the practical design of educational settings.

One of the key reasons, why degrowth is so valuable for ESD is that it is a unifying term and theoretical perspective combining points of critique from different disciplines in a very clear, focused manner: it is fundamentally, and unavoidably, critical of economic growth and capitalism on a systemic level, making it resistant to co-optation. Although this systemic critique is at its core, one of degrowth's strengths is that it equally values the role of both the individual and the collective, particularly in their capacity to actively contribute to building the local economic alternatives that are crucial to the socio-ecological transformation process. In addition to the numerous other theoretical suggestions from degrowth of how economic systems and societies could be organized and framed differently (see section 2.5) - such as post-growth society (Seidl & Zahrnt, 2012; 2016), post-growth economics (Peach, 2017), doughnut economics (Raworth, 2017a) and (re-)productivity and care (Biesecker & Hofmeister, 2010), the sheer number of extremely promising bottom-up approaches to building local economic alternatives is staggering. If such individual and collective experiments (and the individual learning processes that result) were to be scaled up globally, a process to which ESD could contribute considerably, they could well become the starting point for systemic processes of genuine socio-ecological transformations (see Eversberg & Schmelzer, 2018, p. 265).

Moreover, ESD can learn from degrowth how to operate more systemically, specifically in the latter's distinction between the paradigm, ideology and hegemony of growth. The dominant operating modes of economic growth in the global economic system explain best why growth has become paradigmatic and assumed to be without alternative (Schmelzer, 2016). As an ideology, growth embeds itself in our social imaginary, our way of thinking, as well as the culture and values of society. As a hegemony, it maintains hierarchical power relations in society through a variety of mechanisms, such as consumerism.

For ESD, these three concepts – the paradigm, ideology and hegemony of growth – may provide a valuable distinction, which, in practical application in ESD, would help to clarify and solidify ESD's position regarding economic

growth, while preventing it from being derailed by contradictory capitalist economic logic. This is because any sustainability topic considered in these terms necessarily leads to systemic thinking and a more holistic perspective.

ESD may also benefit from degrowth's understanding of how socio-ecological transformations actually take place. According to Muraca (2015), such transformations always take place in the structural and institutional dimension, the dimension of individual and collective practices, and the dimension of the social imaginary. If ESD were to acknowledge that all processes of transformations occur on these three levels and integrate that understanding into its transformative educational processes, it may make education more effective and actually contribute to real social change.

Many of these insights gleaned from the degrowth debate can be supported by the empirical results of this thesis. These results relate to the three constituent parts of ESD – knowledge elements, competency components and pedagogical approaches.

The empirical results from the degrowth-informed educational practice were discussed in detail in sections 5.3, 6.3 and 7.3. Each of these subsections includes various practical examples for the educational process. The reader can follow the discussion of the argument in detail in these respective sections. This main discussion refrains from repeating these detailed discussions with ESD theories, and instead restricts itself to identifying and discussing some of the general trends seen in the results and discussing what these might tell us about what ESD can learn from the degrowth debate.

As presented and discussed in detail in chapter 5, the knowledge elements from the degrowth-informed educational practice which should be integrated in ESD are distinct from existing ESD approaches, especially with regards to the dimensions *causes of unsustainability and barriers to sustainability*, as well as *change and strategies towards sustainability* (see section 5.3).

The mutually constitutive triumvirate of the paradigm, ideology and hegemony of growth mentioned above is linked to the empirical dimension of *causes of unsustainability and barriers to sustainability* in that causes of and barriers to sustainability are equally mutually constitutive.

Chapter 6 presented and discussed the details of competency components from the degrowth-informed educational practice which should be integrated in ESD. The results emphasize that out of eight, three categories in particular – *competency components for unlearning and resistance, competency components for authentic lifestyles* and *manual and practical competency components* – do not have an equivalent in the ESD competency models (see section 6.3). In the entire results, there are, at the very least, three specific abilities that should be integrated in ESD.

The first is reflection. The 'ability to reflect on how economic growth shapes culture and the social imaginary' should be integrated into ESD, because

ESD at present does not do so, and the consequences are evident in its theoretical murkiness.

Secondly, the ability to actively 'question and criticize the impact of economic growth on one's personal life' should be integrated in ESD because this competency component enables the learner to, on an individual level, directly criticize how their personal life is dominated by the ideology and hegemony of growth - a point of departure for learning processes on the more systemic level.

Thirdly, the ability to 'resist and unlearn the cultural practices that relate to economic growth' and thus 'be resilient and resist capitalism' should be integrated into ESD. 'Unlearning' is a relatively new concept in the ESD debate. However, the importance of unlearning unsustainability, rather than learning new things, is stressed by some critical ESD scholars (e.g. Wals, 2010), as well as one of the few publications that explicitly links degrowth to education (Prádanos, 2015).

For degrowth, such unlearning takes place when learners shed common assumptions about economic growth, capitalism and the social imaginary. When critical knowledge of the colonization of the social imaginary by the paradigm of growth and capitalist logic (see above) is combined with the critical ability to practically unlearn related cultural practices, such critical knowledge and abilities can actively be part of *de*colonizing the social imaginary (Latouche, 2015) in the educational process. The role of such unlearning in enabling learners to build resilience to problematic or contradictory aspects of life under capitalism – to alienation or commodification, for instance – is emphasized by degrowth.

As the empirical results of this thesis show, the unlearning of cultural practices that relate to economic growth is one of the key competency components from the degrowth-informed educational practice that should be integrated into ESD. For the learners this means practically unlearning unsustainable lifestyles and behavioral patterns, enabling learners to move beyond merely reflecting on and criticizing lifestyles and actually implement practical changes in their own personal lives. The process of unlearning can, however, also take place outside the personal sphere. Unlearning can also be more broadly political if it applies pressure to the leverage points (Meadows, 1999) of the economic system (see below).

Chapter 7 presented and discussed the pedagogical approaches from the degrowth-informed educational practice which should be integrated in ESD. The results show the two empirical categories, *fostering critical reflection* and *fostering transformative action*, are quite commonly used in ESD. ESD already has many good methods and formats. As the results show, degrowth may have some approaches to contribute which may be complementary to ESD, but there are no entirely 'new' formats that are unique to degrowth.

However, there are some key pedagogical approaches offered by the degrowth-informed educational practice that may be unique when undertaken

within a degrowth context: in particular, the link degrowth makes between knowledge elements and competency components is necessary for initiating change processes that could shift the practical focus of ESD. Examples of such degrowth-specific pedagogical approaches are, for instance, 'excursions to economic alternatives and degrowth lifestyles', 'individual or collective self-experiments in degrowth' and 'collective self-organized change projects with alternative economies'.

ESD may well benefit by embedding its existing pedagogical approaches in a degrowth context. And, building on the results in two of the empirical categories out of section 7.2, it could be said that the more reflective (*fostering critical reflection*) and experiential (*fostering transformative action*) such pedagogical approaches are, the more effective they become, and the more transformative impact they can have.

This thesis was able to empirically demonstrate that, if pedagogical approaches were to become more effective in this way, degrowth-informed ESD could also play a much greater role in larger social change processes. The sum of multifarious small-scale, counter-hegemonic degrowth activities and bottom-up economic alternatives can make education a transformative process.

In their side-debates in the workshop, the experts made a similar point, suggesting that ESD could profit from the more critical discourse of degrowth, which has the capacity to give the debate a much more transformative direction in the context of social change[365]. At first glance, degrowth's claim of provoking change on the macro-level by instituting it on the micro- or meso-levels may seem fanciful, even contradictory. After all, how can degrowth-diaries, repair cafés and urban gardening projects[366] make any meaningful difference? This contradiction soon evaporates upon closer inspection, however – this contrast between scales is no contradiction in fact, but rather a crucial aspect of transformation.

Environmental psychologists are in agreement that acting on "big ideas via small steps" is in concordance with certain aspects of human psychology (Scott et al., 2016, p. 305). Such individual steps can be considered to function as a bridge to more collective or even systemic economic alternatives. As individuals, learners are encouraged not to see their own small steps or changes as an inadequate response to systemic problems. Instead, they each contribute to a degrowth paradigm shift (Buch-Hansen, 2018) that might well be initiated by activities that are part of the key educational approaches suggested in section 7.2.3.

The idea that paradigm shifts result from the application of pressure to leverage points (Meadows, 1999) has recently been adopted by sustainability research (e.g. Abson et al., 2017). This highlights the importance of change

[365] Experts_5: 60; Experts_4: 153; Experts_5: 53; Experts_5: 58
[366] CS_C3.2: Pip_2, 36

taking place on the micro- or meso-levels. Abson et al. point out that deep leverage points, such as systems and paradigms, are especially stable and hard to shift, whereas shallower leverage points, such as policies, subsidies, or taxes, are easier to address (Abson et al., 2017, p. 31). Therefore, changes taking place at these shallower leverage points may pave the way for more fundamental shifts. Likewise, education that enables learners to prize open the cracks in the dominant paradigm can shed light on how transformations might actually happen.

As was suggested above, critical unlearning in degrowth-informed ESD might range from the simple unlearning of lifestyles and behavior patterns to more complex political issues that apply pressure to the leverage points of a system.

Finally, critical unlearning and the building of counter-hegemonic alternatives in degrowth-informed ESD can contribute to socio-ecological transformations on the systemic level because learners' cognition, which is dictated by the growth paradigm due to its presence within the dominant educational praxis, can only be changed through exposure to different experiences (Lave & Wenger, 1991) and by changing ideology (Brookfield, 2012). If, in degrowth-informed ESD, the learners transform their social reality by, for instance, engaging with small-scale degrowth alternatives, those individuals may also transform themselves.

As was explored in section 3.2.2, such a change of ideology can build on transformative learning experiences (Mezirow, 2000), which enable ideology critique and help learning to"come to an awareness of how capitalism shapes belief systems and assumptions (ideologies)" (Brookfield, 2000, p. 128). Individual educational processes in the context of transformative learning aside, an actual shift in political practice can simultaneously result in both individual education and the transformation of the social reality in social movements (Maurer, 2016). From the perspective of social movements, the individual process of learning is in and of itself political, and thus cannot be separated from a political perspective.

The experts in the workshop also suggested that degrowth-informed ESD has the potential to contribute to a 'societal struggle' by including the theme of growth[367]. By involving learners in practical alternatives in the context of degrowth, such as commons or transition movements (see section 2.4), those learners' individual learning processes can, in turn, re-inform the collectivity (Melucci, 1989; 1995) of the degrowth movement. Thus, the question of whether degrowth-informed ESD can indeed transform society can unequivocally be answered in the affirmative.

Some might argue that politically informed education instrumentalizes learners (see section 3.1). They might argue that degrowth is a political

[367] Experts_5: 58; Experts_5: 53

perspective and program (Latouche, 2009) and that it therefore cannot, or ought not, inform ESD. There are some points to oppose here. First of all, parts of the debate on instrumental and emancipatory education are limited to framing discussions. During the expert workshop, the working title used was 'degrowth education', which sparked much controversy over the issue of instrumental education. Among the experts, there was general agreement that one must not educate somebody 'for' degrowth[368] in a manner akin to instrumental ESD1 (Vare & Scott, 2007, see section 3.1).

Secondly – and this may seem somewhat obvious – neutral, value-free education without societally determined guiding principles simply does not exist (see excursus 4). Our contemporary educational system is guided by the dominant principles of the society it serves – currently the economic growth paradigm and neoliberal capitalism. Education always has had and always will have social and economic goals – it mirrors the guiding principles of a society, be they explicit or not (see UNESCO, 2015, p. 79 and chapter 3).

And thirdly, by building on critical-emancipatory conceptions of education (ibid.; Jickling & Wals, 2008), degrowth-informed ESD can be political without being prescriptive. The focus of degrowth-informed ESD is to reflect on and criticize the root causes of unsustainability – the economic growth paradigm, neoliberal capitalism and the colonized social imaginary. It provides emancipatory spaces for learners to unlearn and actively resist hegemonic norms, behavior patterns and lifestyles that align with the growth paradigm. In addition to unlearning on the individual and collective level, degrowth-informed ESD can actually apply pressure to political and systemic levers by involving learners in local economic activities that are intended to be upscaled to systemic counter-hegemonic degrowth alternatives.

Not only theoretically, but also empirically, this thesis has shown that degrowth makes a systemic critique of economic growth and capitalism unavoidable, and that this is something from which ESD could profit immensely.

[368] Experts_5: 60

9 Conclusions

The point of departure for this thesis was the observation that elaborate links between degrowth and ESD are still missing from the discourse. Indeed, large parts of the ESD discourse do not consider degrowth, nor indeed any critical perspectives at all. Nevertheless, the *critical* parts of the ESD community that are critical of economic growth and neoliberalism in education provide a basis upon which this thesis can build. Degrowth, however, has only come into its own as a discourse in the past few years. This thesis therefore investigated what ESD might learn from the emergent discipline of degrowth and found at least three central ideas which ESD would profit from integrating.

Firstly, ESD can learn from the degrowth-informed educational practice how three of its constituent parts, namely knowledge elements, competency components and pedagogical approaches, can be shifted and transformed.

The knowledge elements from the degrowth-informed educational practice focus on the *causes of unsustainability and the barriers to sustainability*, as well as *change and strategies towards sustainability*. The *causes and barriers* are specifically identified as the growth paradigm, capitalism and the colonized social imaginary. "The development and use of knowledge are the ultimate purposes of education, guided by principles of the type of society to which we aspire" (UNESCO, 2015, p. 79). It is no surprise, however, that the empirical results of this study, with regards to *change and strategies,* reflect the social goals of degrowth.

The competency components from the degrowth-informed educational practice have two foci. On the one hand, they focus on the *abilities to reflect and criticize the economic growth paradigm and capitalism*. This goes for the societal but also for the individual sphere. On the other hand, rather merely acquiring new knowledge, they focus on the *abilities to unlearn and to resist cultural practices* relating to *economic growth* and *capitalism*. These would be key to degrowth-informed ESD.

The pedagogical approaches from the degrowth-informed educational practice are, as in much of critical ESD, divided between *fostering critical reflection* and *fostering transformative action*. Key pedagogical approaches taken from degrowth, such as 'excursions to economic alternatives and degrowth lifestyles', 'individual or collective self-experiments in degrowth', 'critical-emancipatory spaces for degrowth' and 'collective self-organized change projects with alternative economies', have the capacity to make the ESD practice more impactful.

Taken together, all these specific key knowledge elements, competency components and pedagogical approaches represent the sum of what this thesis argues ESD can learn from the degrowth debate with regards to three important constituent parts of its discourse.

Secondly, ESD can profit from the consistent and radical transformative perspective that degrowth offers in the sustainability debate. Like one of its key points of reference, Critical Theory, degrowth always has two intentions. In degrowth's case, these are to *criticize* the unsustainable attachment of societies and global economic activity to the growth paradigm while simultaneously working to *transform* societies in such a way that they no longer rely on economic growth. This *criticize/transform* dichotomy could be equally useful in degrowth-informed ESD, making education an active part of critique and transformation.

In the *critical* perspective, degrowth in the narrower sense criticizes how growth as paradigm, ideology and hegemony is the main driving force behind humanity's encountering of our social and biophysical limits on a global scale. If ESD were to apply degrowth's understanding of how any symptom of unsustainability is interconnected in terms of paradigm, ideology and hegemony, educational practices in degrowth-informed ESD might become inured to the hollow promises of economic growth and capitalism, and thus incorruptible.

In the *transformative* perspective, ESD can build on the "degrowth hypothesis […] that it is possible to organize a transition and live well under a different political-economic system that has a radically smaller resource throughput" (Kallis et al., 2018, p. 4.2). Degrowth-informed ESD could provide experimental educational spaces that enable the decolonization of the learners' social imaginaries, while also, through alternative modes of organization (be they individual or collective), prompting counter-hegemonic practices and economic alternatives. These practices may then apply pressure to systemic levers, provoking meaningful change. Therefore, degrowth-informed ESD could be capable of addressing Muraca's three dimensions of transformation (2015) – the social imaginary, individual and collective practices, and structures and institutions – simultaneously.

Finally, and this is perhaps the most important point, the ultimate goal of degrowth is *not* merely to transform ESD. It is to do what much of ESD has not yet accepted is its own *raison d'être*: to positively transform society. A degrowth-informed ESD would have the tools and the theoretical consistency to do so. The abovementioned counter-hegemonic practices that are taking place in the context of degrowth can form a basis for the collective scaling up of local alternatives of lifestyle and economic organization. By building on its links to critical pedagogy, degrowth-informed ESD can offer emancipatory spaces to learners in which they can transform not only themselves, but also their social realities and society as a whole.

In conclusion, degrowth can equip ESD with the tools for an effective critique of economic growth and neoliberal capitalism, the main cause and driver of unsustainability. ESD must continuously resist subsumption into mainstream political and educational endeavors that favor economic growth. Instead it should learn from degrowth to strengthen its critical profile.

Degrowth can help ESD to protect itself against the contradictions inherent in capitalism (see Harvey, 2014). It can challenge unsustainable assumptions and myths; help to combat alienation and the colonized social imaginary in learners' daily lives; as well as fostering resistance to the social imaginary in dominant cultural practice. By involving learners in practical, sustainable alternatives and emancipatory projects that align with the normative foundation of degrowth, such as 'strong' sustainability and care, it can equip learners with the practical and mental tools to unlearn unsustainable individual and collective practices and to also act politically, countering unsustainable systems.

Every study has some blind spots and limitations. One such limitation of this thesis from the educational side is that the empirical results are restricted to only three constituent parts of ESD: knowledge elements, competency components and pedagogical approaches. Further studies could explore on other constituent parts of ESD such as values.

One other limitation of this study is that the empirically identified aspects and dimensions lack depth or nuance in aspects of justice, such as feminist or Global South perspectives, or else climate or environmental justice perspectives. Although the results relating to competency components do indeed mention different aspects of justice, it is underrepresented in the data when the emphasis degrowth as a whole places on aspects of justice is taken into consideration. This is most likely a result of the sampling strategy, which overlooked individuals whose primary expertise is in these fields. The thematic orientation of the chosen educational programs also only emphasized aspects of justice to a limited extent.

Further research could therefore explore the blind spots that result from these limitations. One might ask: Would questions important to degrowth regarding justice or feminist perspectives carry more emphasis in the empirical data if the sampling strategy were altered? It would also be interesting to explore the role of degrowth in the formal education sector, schools in particular. Exploring the potential of alternative education and pedagogies from the perspective of degrowth in more depth could potentially help resolve some of the contradictions of formal education. Another interesting field of research might be analyzing which abilities and critical knowledge applies best to adults who are in vocational training and therefore more directly affected by the economic structures that rely on economic growth. And finally, as a practical outlook and implication of this study, the theoretical findings could be used to create or improve educational materials and methods.

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Appendix

The following appendices were submitted to the doctoral committee:

Concept Paper

Codebook

Coded transcripts

Please contact the author for further questions.